

# PARKING AND TRAFFIC ENGINEERING STUDY

## NEWTONVILLE NEWTON, MASSACHUSETTS



# GPI

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July 2014

*Parking and Traffic Engineering Study  
Newtonville  
Newton, Massachusetts  
July 2014*

# GPI







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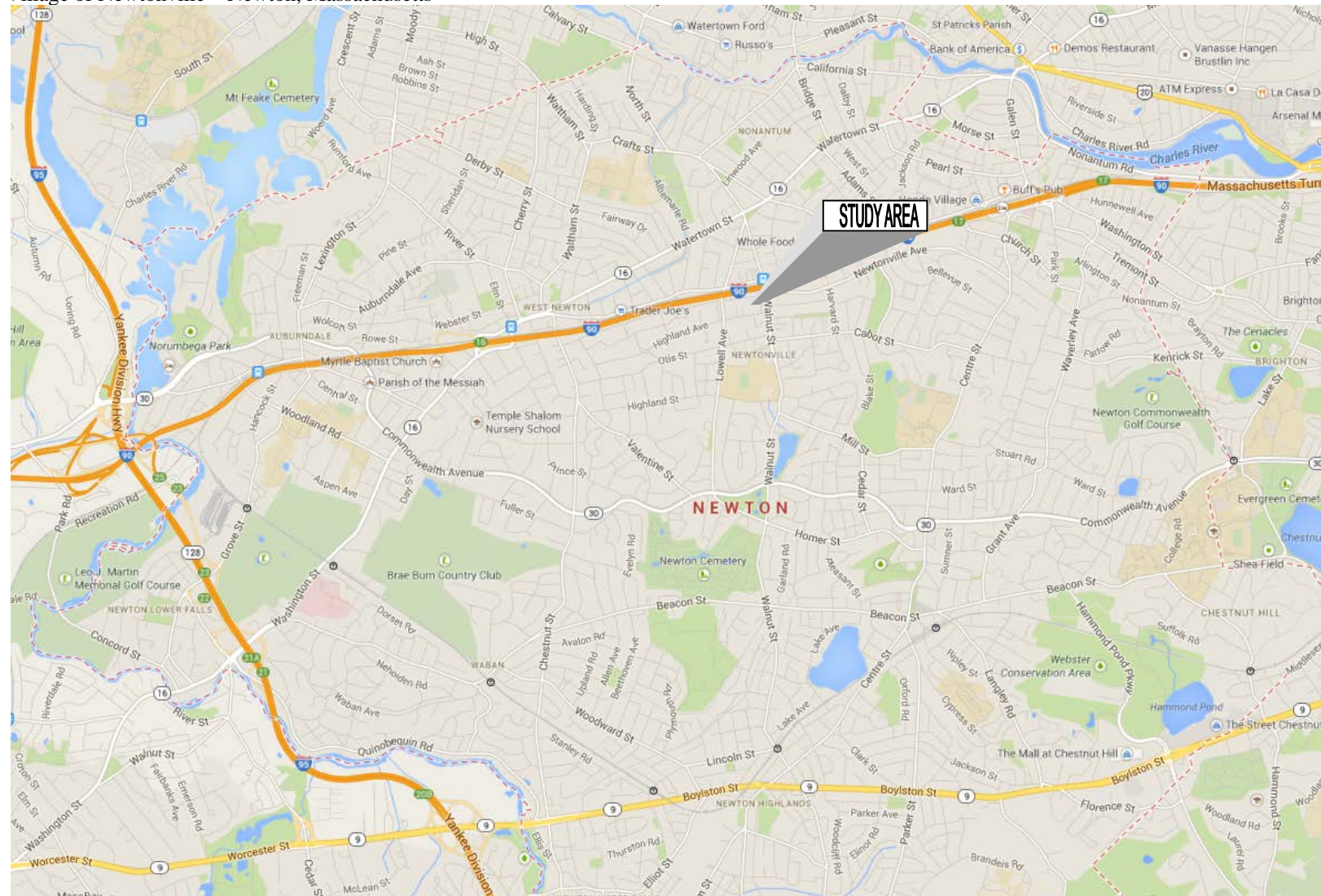
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### Village of Newtonville – Newton, Massachusetts



Source: Google

Figure 1



## PARKING AND TRAFFIC ENGINEERING STUDY

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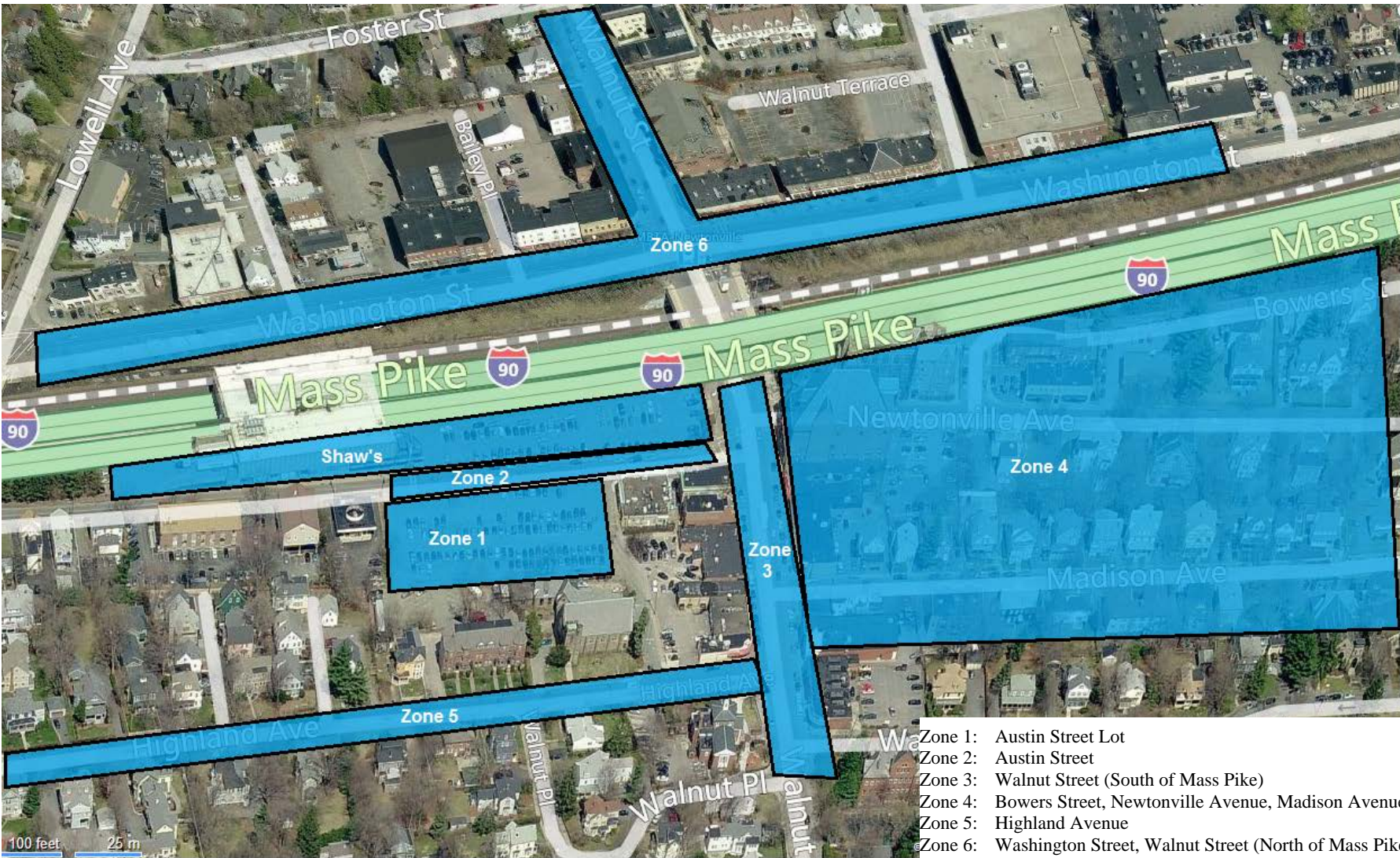


Figure 2



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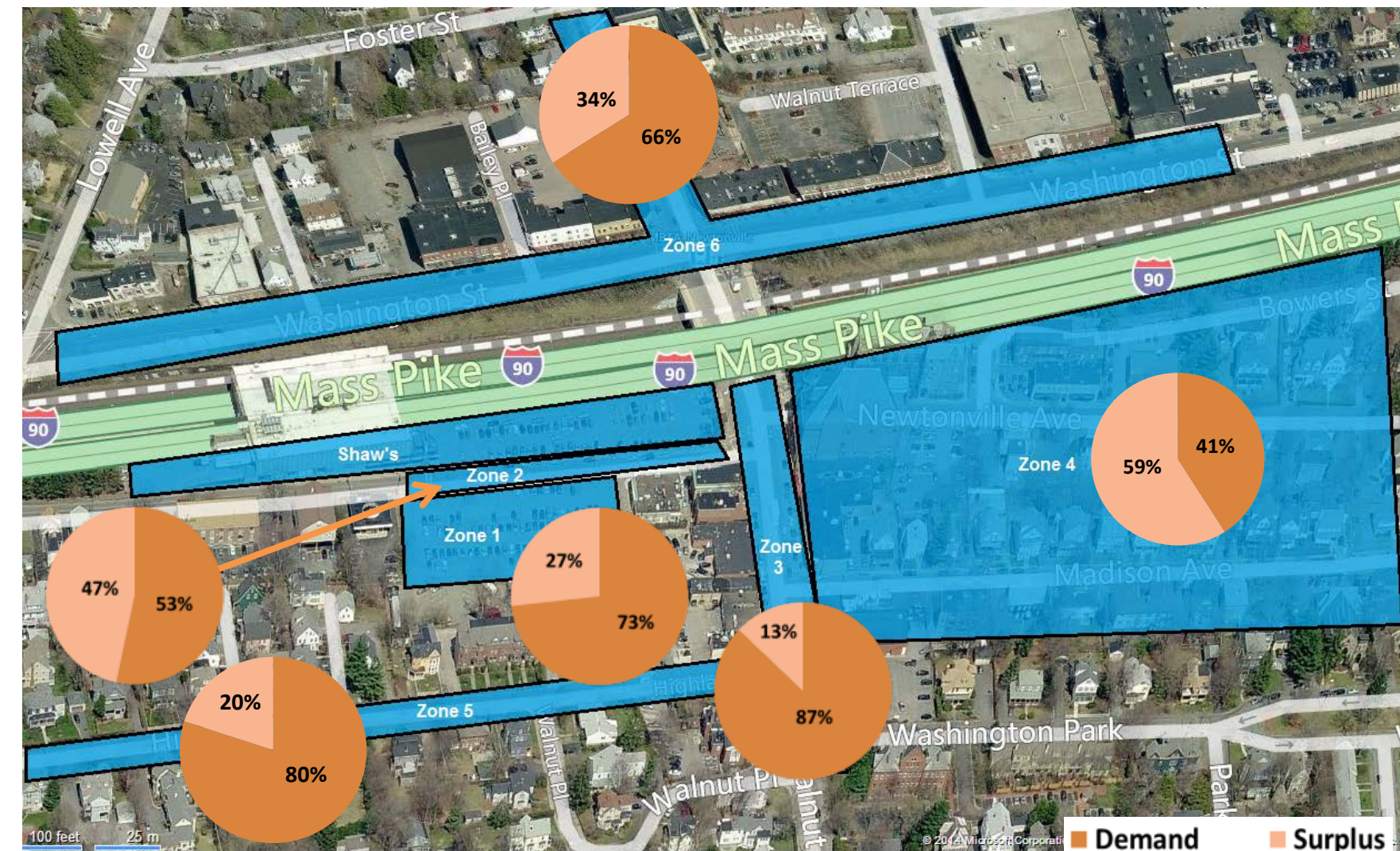
Source: bingmaps.com

**Figure 3**



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Source: bingmaps.com

Figure 4

**GPI** Greenman-Pedersen, Inc.

Engineering and Construction Services

Peak Parking Occupancy by Zone  
(Metered Spaces)  
Saturday Peak 12:00 PM – 1:00 PM



## ***EXECUTIVE SUMMARY***

Greenman-Pedersen, Inc. (GPI) was retained by the City of Newton to prepare a parking and traffic engineering study for the village of Newtonville. The objective of the study is to provide an understanding of the parking utilization and needs for meeting both existing and future parking demands within the Village.

An evaluation of the existing parking activity proximate to the Austin Street parking lot within the village of Newtonville in Newton, Massachusetts has been completed. The City of Newton is currently exploring the viability of proposals for redevelopment of the surface parking Austin Street lot as a mixed-use development with residential units, ground-floor retail space, public open space, and designated parking associated with the development.

This study presents the findings regarding existing conditions, including the interaction between the public parking supply and the Shaw's Supermarket parking lot, and an evaluation of parking demand rates associated with generic mixed-use development. The study presents an extensive analysis of the metered spaces within the study area as they are considered the primary resource of parking available to retail/commercial uses in the Newtonville area. The study determined that the existing parking demands reach 78% of parking supply capacity at its peak which occurs on Saturdays from 12:00 PM – 1:00 PM throughout Newtonville. This existing public parking demand of metered parking falls within the functional supply for parking.



### ***EXISTING CONDITIONS***

Newtonville is defined as one of the 13 villages within the City of Newton, Massachusetts, falling generally north of the center of the City. The study area associated with this effort focuses on an approximately 0.05 square mile area surrounding the Austin Street lot translating to an approximately 5-minute walk to area businesses. Figure 1 depicts a map of the study area, in relation to the City of Newton. Figure 2 presents an aerial of the parking inventory and associated parking regulations included within the study, as defined by discussions with City staff. The metered parking is considered the parking supply available to retail/commercial uses in the study area.

The Newtonville area is comprised of generally small retail businesses, office spaces and specialty restaurants. The majority of these businesses operate in one/two-story buildings along the frontage of Walnut Street, Austin Street and Washington Street, with the center of the activity on Walnut Street, south of Austin Street. The one outlier is the Shaw's Supermarket located at 33 Austin Street, which occupies airspace over Interstate I-90 (Massachusetts Turnpike). Surrounding the commercial uses are residential neighborhoods comprising of a mix of single-family homes and small multifamily homes.

### **ROADWAY INFRASTRUCTURE**

Walnut Street, an urban minor arterial of noted significance in this area, runs north-south from Route 16 (Watertown Street) to the north to Route 9 (Boylston Street) to the south. The segment of roadway which traverses through Newtonville provides one travel lane in each direction and is approximately 50 feet wide, with 11 foot travel lanes and eight foot parallel parking stalls. Walnut Street has a painted median, with various degrees of fading, which is approximately 12 feet wide running the length of the roadway between Austin Street to the north to Newton North



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High School to the south. At the intersection of Walnut Street at Austin Street an exclusive left-turn lane is provided for vehicle storage in the northbound direction, and an exclusive right-turn lane is provided in the southbound direction. Walnut Street right-of-way widens on the bridge over Interstate I-90 (Massachusetts Turnpike) to provide exclusive turn lanes at the intersection with Washington Street. The posted speed limit along Walnut Street in the area is 25 mph.

Another roadway of significance within the study area is the east/west urban minor arterial route of Washington Street, which runs parallel to I-90 to the north and intersects with Walnut Street within the study area. The only signalized intersection within the study area is the intersection of Washington Street at Walnut Street. Washington Street provides two approximately 12 foot wide general purpose travel lanes in each direction and on-street metered parking is provided on both sides of the roadway. Sidewalks are also provided along both sides.

Bowers Street, Newtonville Avenue, Madison Avenue, Austin Street and Highland Avenue are also included in the study area. These roadways all run in an east/west direction with a terminus at Walnut Street and are predominately residential in nature. These roads all provide right-of-way for two-way vehicular travel, though not marked with any pavement markings. Sidewalks are generally provided on both sides of these roadways, as well as on-street parking. All roadways intersecting with Walnut Street are under STOP control. Philip Bram Way is a north/south running access roadway that connects Highland Avenue to Austin Street. This roadway is part of the Austin Street lot and is utilized predominately for access/egress to the Austin Street municipal parking lot and to service the shops beside it.

Within the defined study area of Newtonville all roadways are City of Newton maintained, with the exception of I-90 which is state-maintained and runs east/west below grade, directly south of Washington Street.

## **PUBLIC TRANSPORTATION**

Newtonville is well served by the Massachusetts Bay Transportation Authority's (MBTA) public transportation services. Most prominently, access to the Framingham/Worcester Commuter Rail Line, with inbound service to Back Bay and South Station in Boston, is accessible at the Newtonville Station, directly north of the Mass Pike. Newtonville Station currently provides bicycle parking via a comb-type bike rack on the northeast corner of Washington Street/Walnut Street with capacity for approximately 16 bicycles. The station is below street level and is accessible via stairs off of Walnut Street and is currently not handicap accessible.

Three express (Routes 553, 554 and 556) and one local (Route 59) bus route serve Newtonville along Washington Street and Walnut Street. These routes provide connections to Waltham



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Center, Central Square, Waverley Square, Downtown Boston, Needham Heights and Watertown Square.

## **PEDESTRIAN/BICYCLE ENVIRONMENT AND ACCESSIBILITY**

Sidewalks on all of the study area streets are in generally good condition with accessible ramps, striped crosswalks and pedestrian signals at the signalized intersection of Washington Street at Walnut Street. Sidewalks are generally present along both sides of each of the study area roadways, providing a complete pedestrian system as these streets are heavily traveled by pedestrians due to the retail activity, the presence of public transportation, and the nearby Newton North High School. Sidewalks along Walnut Street experience a heavy pedestrian volume and are currently seven feet wide (including tree boxes). Crosswalks are provided across Walnut Street at the intersections with Washington Street, Newtonville Avenue/ Austin Street and Madison Avenue. Crosswalks are provided across all approaches of the key intersection of Walnut Street at Austin Street, with a pedestrian refuge island provided across the northern approach.

The signalized intersection of Washington Street at Walnut Street provides an exclusive pedestrian crossing. The pedestrian phase is actuated, meaning that pedestrians must use the pedestrian push button in order for the signal to display a walk light. Crosswalks are provided across all approaches of the intersection. Currently, there are no specific on-street bicycle facilities in the study area.

## **PARKING INVENTORY**

The parking inventory included within this study consists of all legal public parking spaces, as well as the parking lots serving the private use of Shaw's Supermarket located at 33 Austin Street. The leased parking serving the permit-only Newton North High School (NNHS) students within the Austin Lot, the post office parking along Washington Street, and all individual business-leased spaces behind businesses along Walnut Street, were not included in this study.

The parking inventory includes on-street parking that is available for use throughout the day. The public parking supply in the study area totals 448 spaces, including the 32 currently marked "NNHS Tiger permit-only" spaces within the Austin Street lot. There are 172 metered on-street parking spaces, 117 unmetered on-street parking spaces, and 159 metered surface lot spaces within the Austin Street lot. A total of eight handicap parking spaces are included in the parking inventory, four within the Austin Street lot and four are provided on-street. Discussion of the



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Shaw's Supermarket parking inventory and the role it plays in the study area parking demands will be discussed separately later in this study.

On-street metered parking fees are in effect from 8:00 AM to 6:00 PM weekdays and Saturdays. The hours of meter fees are the same for the Austin Street lot, except for Saturdays when there are no fees although parkers may be unaware of this. The cost of the metered parking is \$0.75 per hour, both within the Austin Street lot and on-street, with the exception of the long-term 12-hour meters which are \$0.50 per hour. Sundays and holidays are free of charge throughout the study area. In addition, all handicap spaces are provided to the public free of charge. A detailed breakdown of the parking inventory time restrictions is presented within Table 1.

**Table 1: Existing Newtonville Parking Inventory Summary**

Space Type	Time Restrictions					Total Space Inventory	
	1 Hour	2 Hour	3 Hour	12 Hour	Unrestricted		
On-Street Metered	90	40	-	42	-	172	39%
On-Street Unmetered	45	68	-	-	-	113	25%
On-Street Handicap	-	-	-	-	4	4	1%
<b>Total On-Street</b>	<b>135</b>	<b>108</b>	<b>-</b>	<b>42</b>	<b>4</b>	<b>289</b>	<b>65%</b>
Metered Austin Street Lot	-	-	68	55	-	123	27%
Handicap Austin Street Lot	-	-	-	-	4	4	1%
NNHS Permit-Only*	-	-	-	-	32	32	7%
<b>Total Austin Street Lot</b>	<b>-</b>	<b>-</b>	<b>68</b>	<b>55</b>	<b>36</b>	<b>159</b>	<b>35%</b>
<b>Total Space Inventory</b>	<b>135</b>	<b>108</b>	<b>68</b>	<b>97</b>	<b>40</b>	<b>448</b>	<b>100%</b>
	<b>30%</b>	<b>24%</b>	<b>15%</b>	<b>22%</b>	<b>9%</b>	<b>100%</b>	<b>-</b>

\* NNHS Tiger Permit-Only Spaces are only enforced 8:00 AM – 4:00 PM on school days – therefore these spaces are available nights and weekends. Only 30 spaces rather than 32 were bagged for NNHS permit-only on two of the six observation dates, however to be conservative this study assumes 32.

Note that Saturdays in the Austin Street Lot are free and therefore no time restriction is enforced.

On-street unmetered spaces are approximate based on signage and available curb spaces with vehicles parked efficiently.

On-street unmetered spaces are unrestricted in time on Highland Avenue and Madison Avenue between 7PM-7AM, on Newtonville Avenue between 6PM-8AM and on Bowers Street between 8PM-7AM.

As detailed within Table 1, public parking available within the Newtonville study area consists of 448 inventoried spaces, 289 of which are on-street while the remaining 159 are located within the Austin Street lot, rendering approximately 65% of spaces being on-street, while 35% are within the Austin Street lot.

In terms of time restrictions currently signed and enforced within the study area, approximately 135 spaces are designated for one-hour parking, 108 two-hour, 68 three-hour, 97 12-hour, and 40



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unrestricted spaces consisting of permit-only and handicap spaces. This breakdown translates to approximately 30% of spaces designated as one-hour, 24% two-hour, 15% three-hour, 22% 12-hour and 9% unrestricted. All of the one-hour spaces are on-street, 90 of which are metered and 45 are unmetered. Similarly, all two-hour spaces are on-street, 40 of which are metered and 68 are unmetered. All 68 three-hour spaces are metered and are located within the Austin Street lot. All 12-hour spaces are metered, 42 are on-street and 55 are within the Austin Street lot. Lastly, all 32 NNHS permit-only spaces are unrestricted and are within the Austin Street lot. Four of the eight handicap spaces are within the Austin Street lot, with the remaining four on-street.

It should be noted that the above referenced time restrictions are not enforced on Sundays and holidays, nor on Saturdays within the Austin Street lot. On-street unmetered spaces are unrestricted in the evening hours, 8pm-6am for the 2-hour and 7pm-7am for the 1-hour.

## **PARKING OCCUPANCY**

Extensive observations were made of the parking occupancy within the Newtonville study area. Hourly parking occupancy counts were collected for two typical weekdays and two Saturdays in March 2014. These counts were supplemented with two additional Saturday counts in May 2014 to confirm typical conditions.

The hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on Thursday, March 20, 2014 and Tuesday, March 25, 2014, in order to capture two days of typical weekday parking activity. Hourly Saturday parking occupancy counts were conducted from 9:00 AM – 9:00 PM on Saturday, March 15, 2014 and Saturday March 22, 2014. Additional Saturday observations were made for all metered spaces, south of the Mass Pike including the Austin Street lot as the initial data yielded that the meters in this area, particularly on Saturdays, were the critical peak occupancy of the observations. The additional Saturday data were collected on Saturday, May 3, 2014 and Saturday, May 17, 2014. Particular attention was paid to the weather conditions on the data collection days, all of which were observed to experience none to minimal rain and moderate temperatures. The following sections of this study address occupancy for the overall study area, and then break down into individual parking areas/zones. The complete parking occupancy counts are provided in the Appendix.

### **Newtonville Area-wide Utilization**

Parking occupancy counts for the entire study area yielded average utilization of parking to be approximately 45% and 50% on a typical weekday from 7:00 AM – 8:00 PM and on a typical

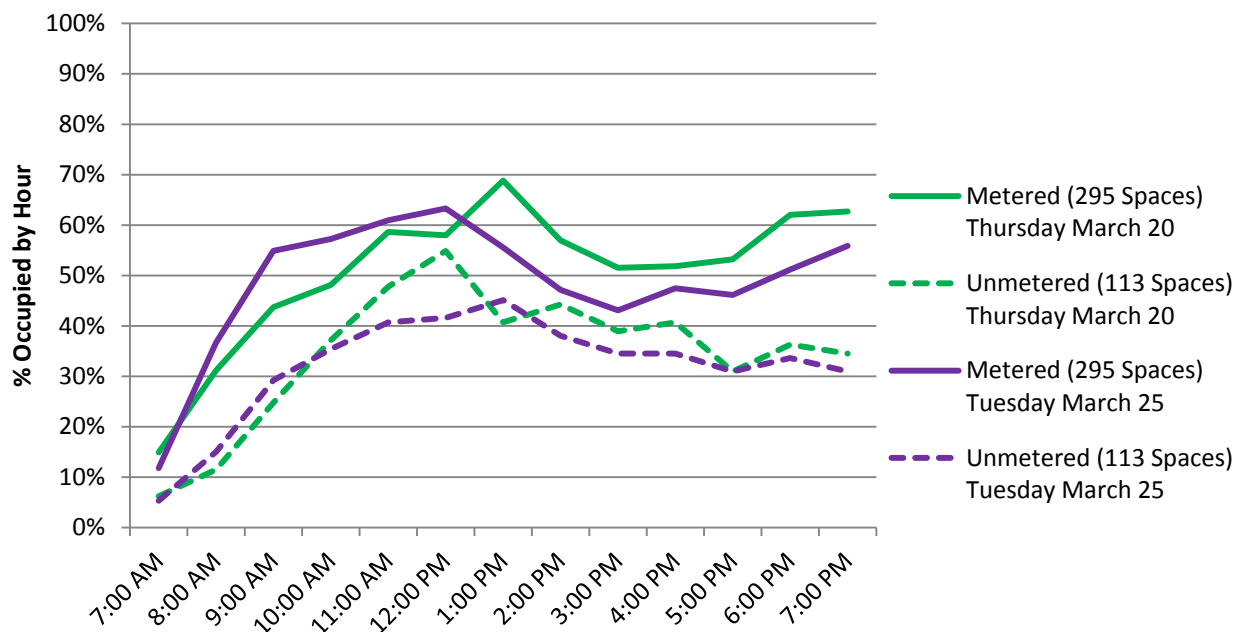


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Saturday from 9:00 AM – 9:00 PM, respectively. During the week, peak overall utilization was observed to occur from 1:00 PM – 2:00 PM at 61% occupancy. On Saturday, peak overall utilization occurred from 12:00 PM – 1:00 PM at 67% occupancy. Chart 1 and Chart 2 present percent occupancy by time of day for each of the days collected, separating metered parking and unmetered parking. As can be seen within these charts, throughout the course of the observations occupancy never reaches capacity. It should be noted that Chart 2 includes additional metered parking occupancy data for the two additional data collection days. The percent occupancy displayed represents the occupancy observed for the metered parking south of the Mass Pike only, which totals 194 spaces.

Peak utilization of metered parking on a weekday occurred on the Thursday, March 20<sup>th</sup> at 69% from 1:00 PM – 2:00 PM. The unmetered parking utilization also peaked on the Thursday but at 55% from 12:00 PM – 1:00 PM. Saturday metered parking utilization peaked from 12:00 PM – 1:00 PM at 79% on Saturday, March 22<sup>nd</sup>, while the unmetered Saturday utilization peaked from 11:00 AM – 12:00 PM at 41%.

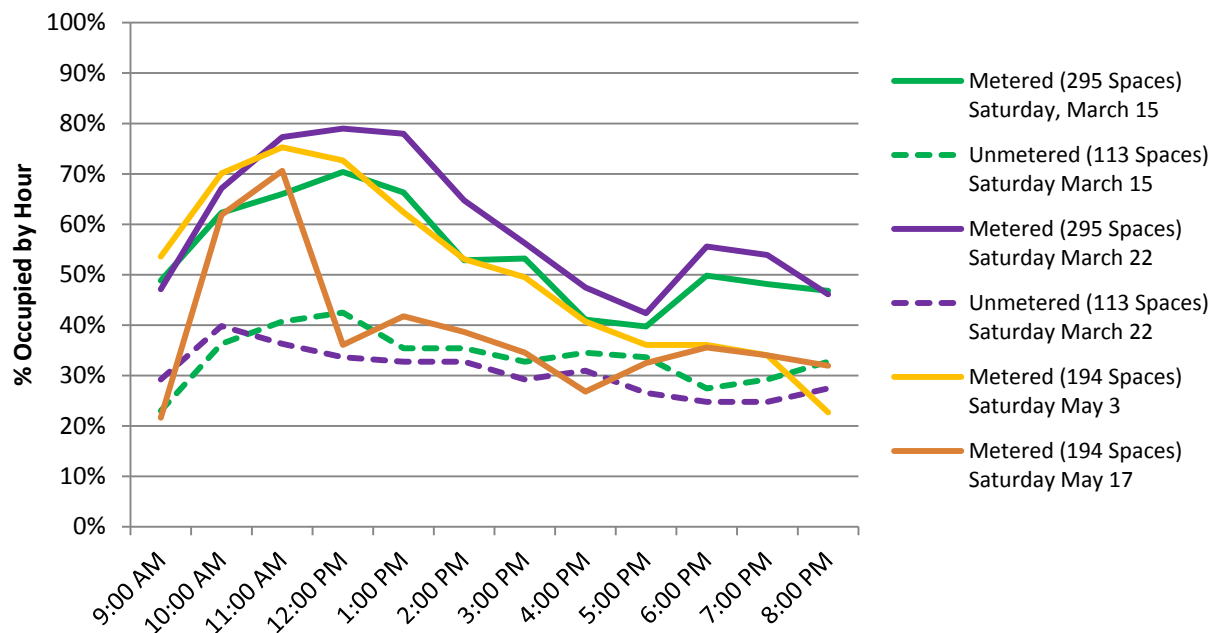


**Chart 1: Hourly Weekday Parking Utilization (by type)**



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**Chart 2: Hourly Saturday Parking Utilization (by type)**

In general it can be noted that during the week parking demand within Newtonville peaks between 11:00 AM – 2:00 PM and again gets close to peak after 5:00 PM. Saturdays experience a similar pattern with the peak beginning closer to 10:00 AM – 2:00 PM and again seeing that uptick around 6:00 PM. These data also depict that the unmetered parking within the study area is less utilized than the meters essentially every hour of the study.

These data demonstrate that demand in the overall study area never exceeds the industry standard goal of 85% of supply. In general 85% of overall supply is considered the ‘functional supply’ of a parking system. Under existing conditions the overall Newtonville study area never experiences demand greater than its functional supply, both in metered and unmetered spaces individually.

While the overall peak utilization in the Newtonville study area is during the aforementioned hours, not all parking areas, or zones, within the study area peak at the same hour of the day. In order to differentiate the various areas of parking in Newtonville, six zones were defined for use within this study. Table 2 summarizes the six parking zones defined for use in this study. Figure 3 defines the six parking zones on an aerial map of Newtonville, for reference. Further detailed findings regarding the individual zones are discussed within this section of the study. As mentioned, all public parking surveyed for this study is on-street with the exception of the Austin Street lot.



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**Table 2: Newtonville Parking Inventory by Zone**

Parking Zone	Total Parking Supply			
	Metered	Unmetered	Handicap	Total
Zone 1: Austin Street lot	123	-	4	127
Zone 2: Austin Street	15	-	-	15
Zone 3: Walnut Street (south of Mass Pike)	30	-	1	31
Zone 4: Bowers Street, Newtonville Avenue, Madison Avenue	21	51	1	73
Zone 5: Highland Avenue	5	45	-	50
Zone 6: Washington Street, Walnut Street (north of Mass Pike)	101	17	2	120
<b>Total Parking Supply</b>	<b>295</b>	<b>113</b>	<b>8</b>	<b>416</b>

On-street unmetered spaces are approximate based on signage and available curb spaces with vehicles parked efficiently.

Note 32 spaces in Austin Lot were bagged and designated for NNHS Permit only, bringing the inventory for public use down to 127.

Note unmetered spaces in Zones 4 -6 are not included in the analysis of available spaces.

The various zones within the study area focus on an approximately five-minute walk to area businesses, centralized by the intersection of Walnut Street at Austin Street. The extents of the on-street parking encompassed in the study include the length of Washington Street from its intersection with Lowell Avenue to the west to Central Avenue to the east (where the head-in spaces on the southern edge end), Walnut Street from Foster Street to the north to Washington Park to the south, and Austin Street and Highland Avenue from Lowell Avenue to Walnut Street. In addition Madison Avenue, Newtonville Avenue and Bowers Street from Walnut Street to the west for a length of approximately 0.10 miles (~500 feet) to the east in order to capture a reasonable walking distance from the center of retail activity.

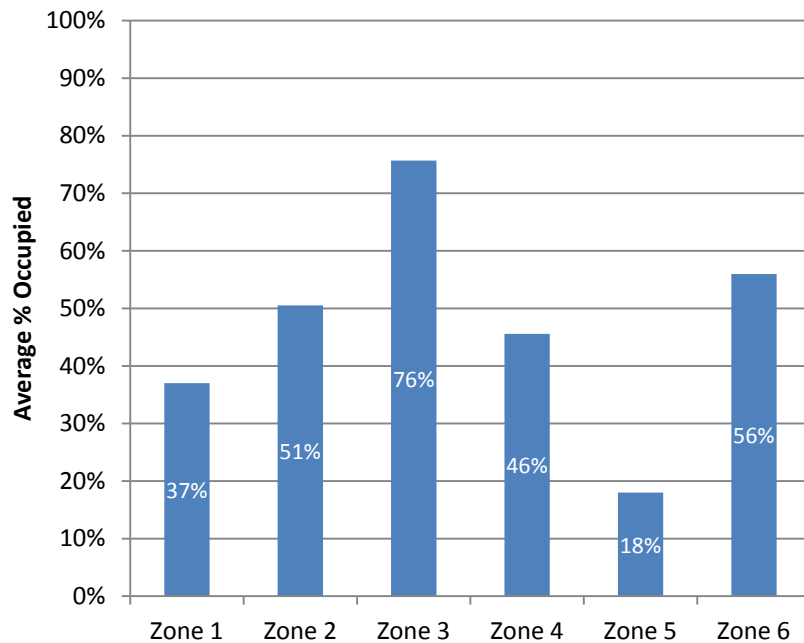
Zones 1-3 and 6 are generally defined by metered parking spaces available to retail/commercial users, while Zones 4 and 5 are generally residential unmetered parking zones. The unmetered spaces are not considered a resource to meet parking demands associated with retail/commercial development in the area as these spaces are generally located on residential streets. Therefore these spaces are not included in the existing parking occupancy analyses that follow, as these spaces are not considered a resource for retail/commercial development in Newtonville.

Average and peak observed occupancy within the six zones varies rather significantly depending on metered vs. unmetered spaces and proximity to retail and business uses. Charts 3 through 6 depict average and peak weekday and average and peak Saturday occupancy for each of the zones, respectively. Note that Saturday Zones 1-3 include four days of data, while the rest is based on two days of data, as discussed previously.



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**Chart 3: Average Weekday Occupancy by Zone**  
(metered & unmetered)

### Legend

Zone 1: Austin Street lot\*

Zone 2: Austin Street

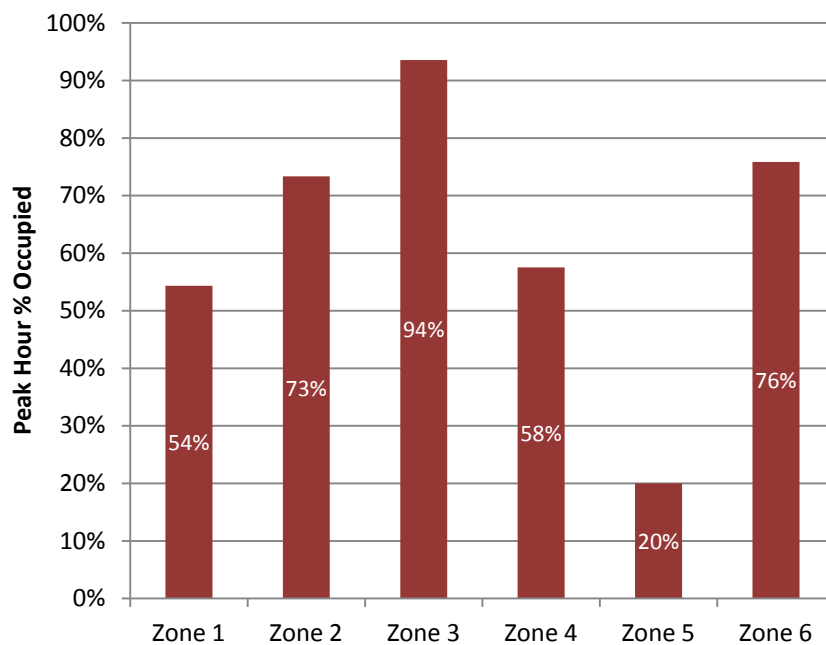
Zone 3: Walnut Street (south of Mass Pike)

Zone 4: Bowers Street, Newtonville Avenue, Madison Avenue

Zone 5: Highland Avenue

Zone 6: Washington Street, Walnut Street (north of Mass Pike)

\*Excludes Tiger Permit Only Spaces

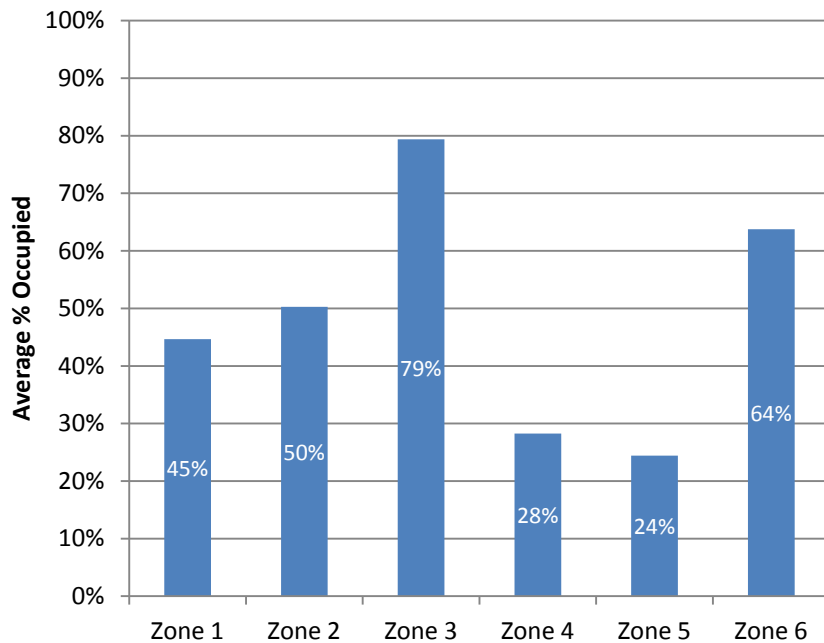


**Chart 4: Peak Hour Weekday Occupancy by Zone (1:00 PM – 2:00 PM)**  
(metered & unmetered)



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### Legend

Zone 1: Austin Street lot

Zone 2: Austin Street

Zone 3: Walnut Street (south of Mass Pike)

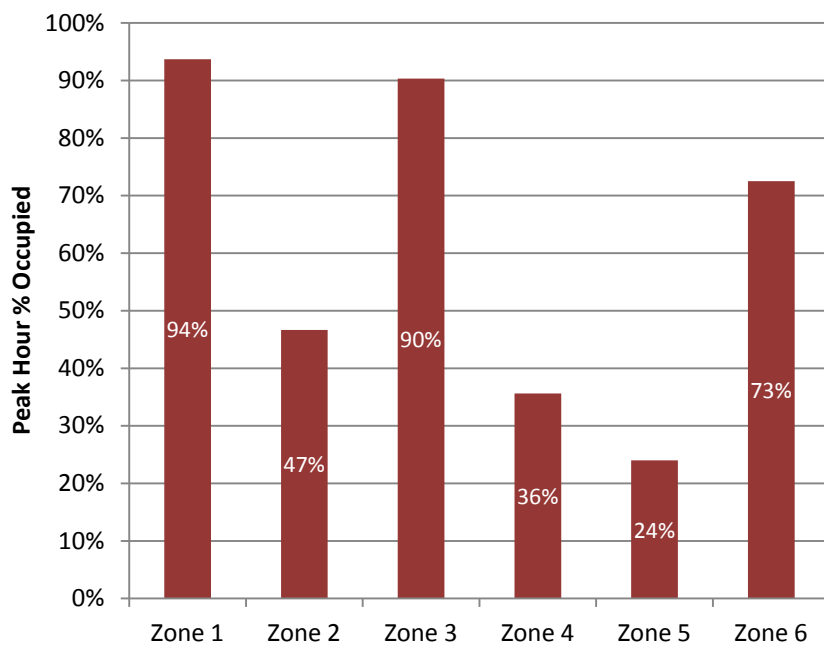
Zone 4: Bowers Street, Newtonville Avenue, Madison Avenue

Zone 5: Highland Avenue

Zone 6: Washington Street, Walnut Street (north of Mass Pike)

\*Excludes Tiger Permit Only Spaces

**Chart 5: Average Saturday Occupancy by Zone**  
(metered & unmetered)



**Chart 6: Peak Hour Saturday Occupancy by Zone (12:00 PM – 1:00 PM)**  
(metered & unmetered)



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The following sections describe specific findings of the parking occupancy studies based on each defined Zones 1 through 6. Again, the unmetered spaces are not included in the existing parking occupancy analyses that follow, as these spaces are not considered a resource for retail/commercial development in Newtonville.

### **Zone 1: Austin Street Lot**

As previously discussed, hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on four Saturdays in March and May 2014 within the Austin Street lot. The Austin Street lot currently provides 127 off-street public parking spaces, 123 of which are metered and four of which are designated handicap (an additional 32 spaces are NNHS Tiger permit-only).

Parking occupancy counts for the Austin Street lot (Zone 1) yielded average utilization to be approximately 37% and 45% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. During the week, utilization of the Austin Street lot peaked from 11:00 AM – 12:00 PM at 65% occupancy. On Saturday, peak overall utilization occurred from 12:00 PM – 1:00 PM at 94% occupancy. Table 3 presents the peak observed total number of vehicles parking within the Austin Street lot for each day of data collection.

**Table 3: Zone 1 - Austin Street Lot Peak Occupancy by day**

Collection Date	Peak Vehicles	Percent Occupied	Hour of Peak
<i>Weekdays</i>			
Thursday March 20, 2014	69	54%	1:00 PM – 2:00 PM
Tuesday March 25, 2014	84	66%	11:00 AM – 12:00 PM
<i>Saturdays Overall*</i>	93	73%	12:00 PM – 1:00 PM
Saturday March 15, 2014	97	76%	12:00 PM – 1:00 PM
Saturday March 22, 2014	119	94%	12:00 PM – 1:00 PM
Saturday May 3, 2014	95	75%	11:00 AM – 12:00 PM
Saturday May 17, 2014	86	67%	11:00 AM – 12:00 PM
<b>Total Parking Supply</b>	<b>127</b>		-

\* Peak vehicles of 93 represents the 'average critical peak occupancy' on the Saturdays observed.

Note 32 spaces in Austin Lot were bagged and designated for NNHS Permit only, bringing the inventory for public use down to 127.

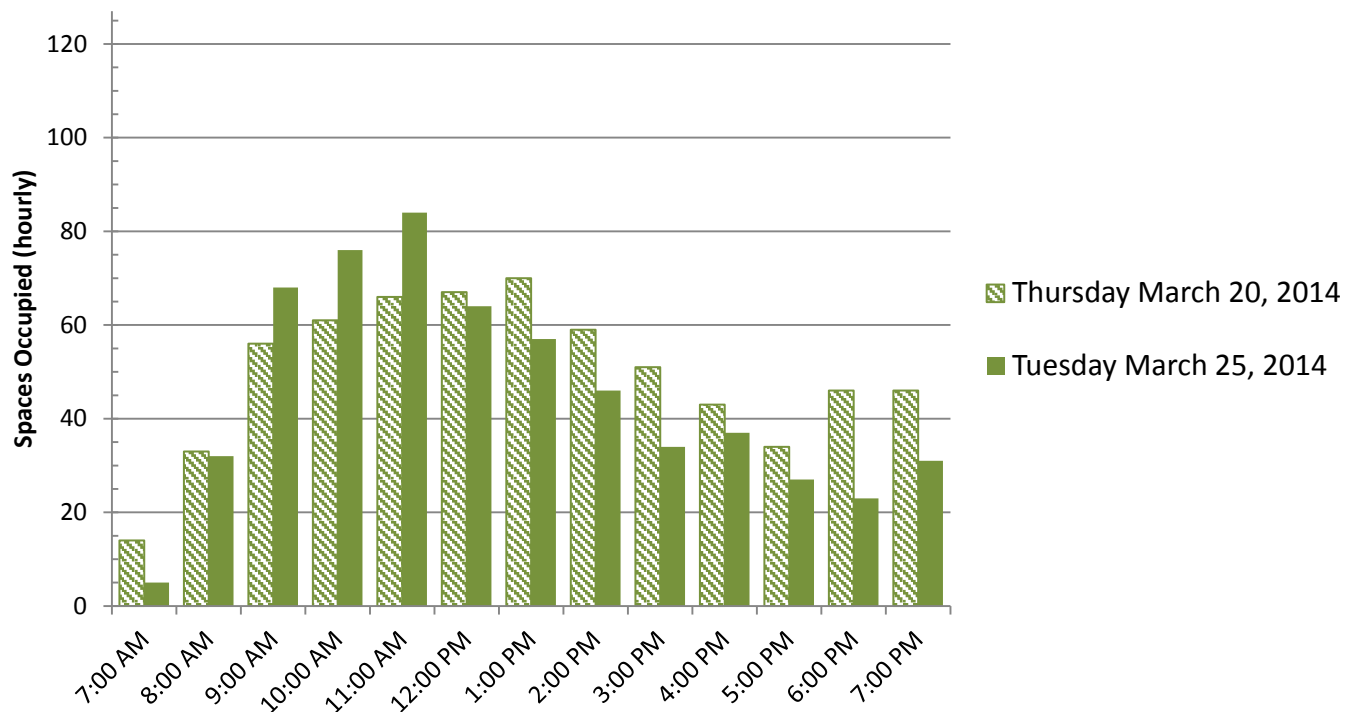
These data depict that while the peak observed occupancy during the study dates was observed to be 119 cars parked in the 127 spaces in the Austin Street lot, this occupancy was only realized for one-hour of the 74 hours of parking observations. In fact, this peak occupancy is approximately 20% higher than any other day counted and is considered an outlier. The average



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critical peak of the three other Saturdays is considered the normalized average peak occupancy which calculates to 93 vehicles. This peak value is utilized for the existing overall parking demands calculations later in this study. Chart 7 and Chart 8 depict the hourly occupancy of the Austin Street lot observed for each of the six days of data collection on weekdays and Saturdays, respectively. The x-axis represents each hour of the day (start time), while the top of the y-axis represents the total parking supply.

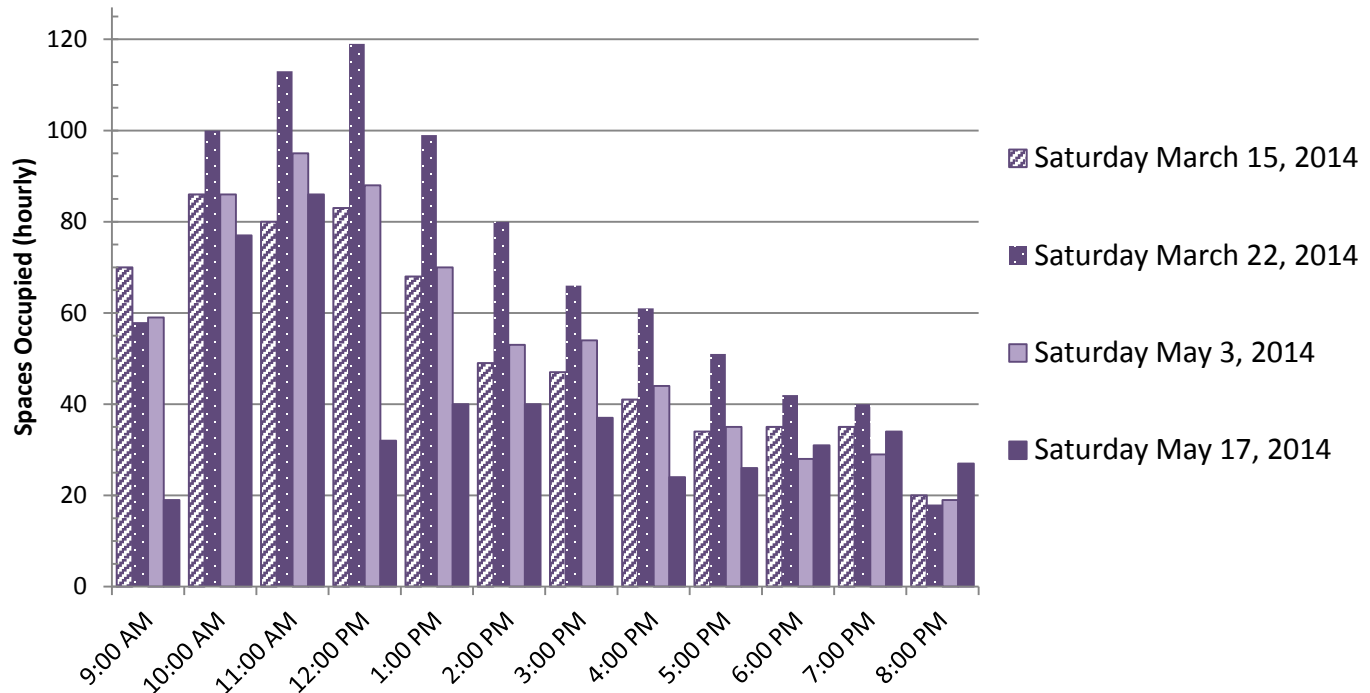


**Chart 7: Hourly Weekday Occupancy (Zone 1 – Austin Street Lot)**



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**Chart 8: Hourly Saturday Occupancy (Zone 1 – Austin Street Lot)**

From these data it can be deduced that in general the Austin Street lot is underutilized, though it does experience some peak demand hours. Occupancy within the Austin Street lot generally peaks between the hours of 10:00 AM – 12:00 PM during the week and between the hours of 10:00 AM – 2:00 PM on Saturdays. All days of observations experienced a peak in the late morning and gradually declined as the day progressed. Weekdays did however experience a slight uptick in occupancy from 6:00 PM – 8:00 PM as well. As the Austin Street lot is a key component of this study, further more refined observations regarding origin, destination, and various survey questions were asked of parkers. Discussion on these anecdotal observations is discussed in the Parking Surveys section of this study.

### **Newton North Tiger Permit Only Spaces**

In addition to the 127 publically available spaces within the existing Austin Street lot, there are currently 32 spaces within the lot which are designated for NNHS permit-only parking. These spaces occupy the southwestern-most corner of the lot and were not inventoried as part of this study, as they are not considered part of the public parking supply within the study area. It should be noted that within this area of 32 Tiger Permit spaces a Goodwill donation trailer occupies approximately six of the permit-only spaces, and therefore were not included in the



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available inventory for this study. Additionally, the NNHS Tiger Permit Only spaces are signed/enforced 8:00 AM – 4:00 PM on school days only, therefore these spaces are technically available to the public in the evenings and on the weekends, though they are seldom utilized.

Anecdotal observations of the utilization of these spaces were included in the study, though actual occupancy counts were not conducted. The spaces were generally noted to be utilized by student vehicles during school hours on weekdays, with most vehicles leaving by approximately 3:00 PM. On the weekday evenings, after the school hours, the spaces were generally unoccupied by public demand. On the Saturdays, these spaces were observed to be utilized solely for quick turnover Goodwill drop-offs, while otherwise unoccupied. These observations allow for a comprehensive understanding of the utilization of these spaces, further substantiating the findings of this study.

### **Zone 2: Austin Street**

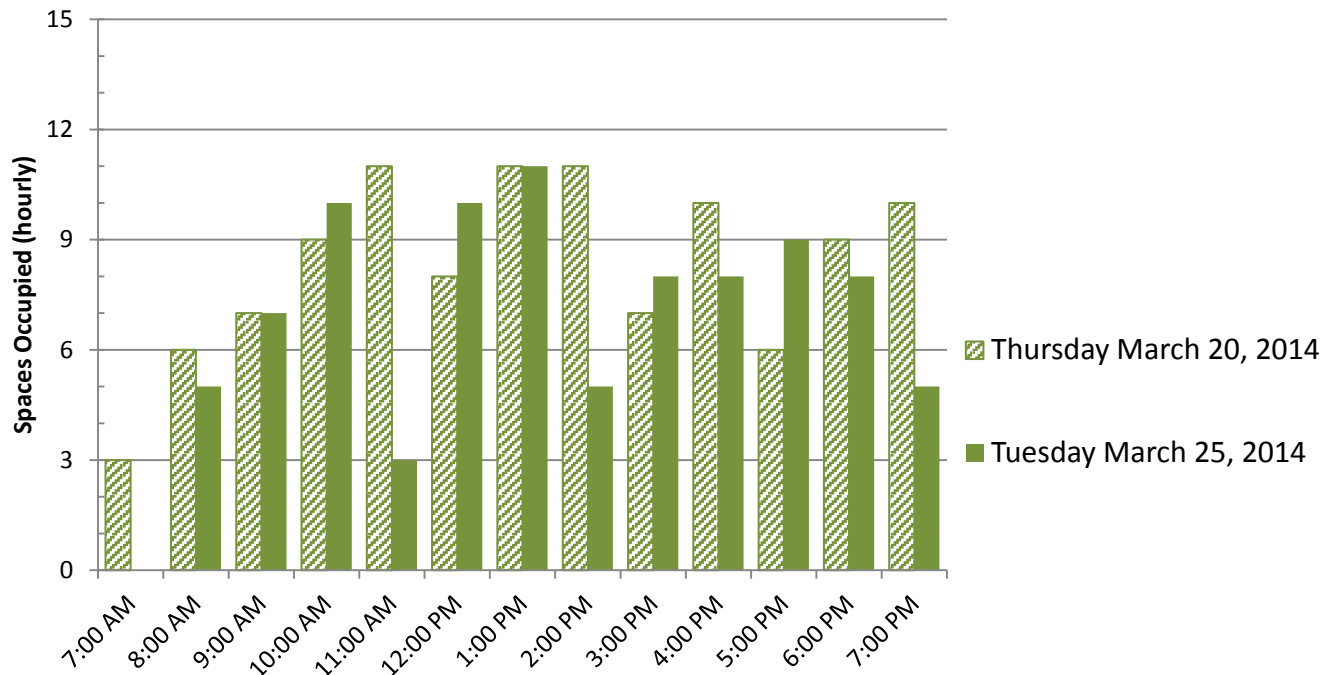
Along Austin Street, hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on four Saturdays in March and May 2014. Austin Street currently provides 15 on-street metered public parking spaces. These spaces are provided on the Walnut Street (eastern) end of Austin Street, with 11 spaces on the north side and four on the south.

Parking occupancy counts for the Austin Street meters (Zone 2) yielded average utilization to be approximately 51% and 50% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. During the week, utilization of the Austin Street on-street meters peaked from 1:00 PM – 2:00 PM at 73% occupancy with 11 vehicles parked in the 15 spaces. On Saturday, peak overall utilization occurred from throughout the course of the day at 80% occupancy, with 12 vehicles. Chart 9 and Chart 10 below represent the hourly occupancy observations for the Austin Street meters (Zone 2) on the weekdays and Saturdays, respectively.

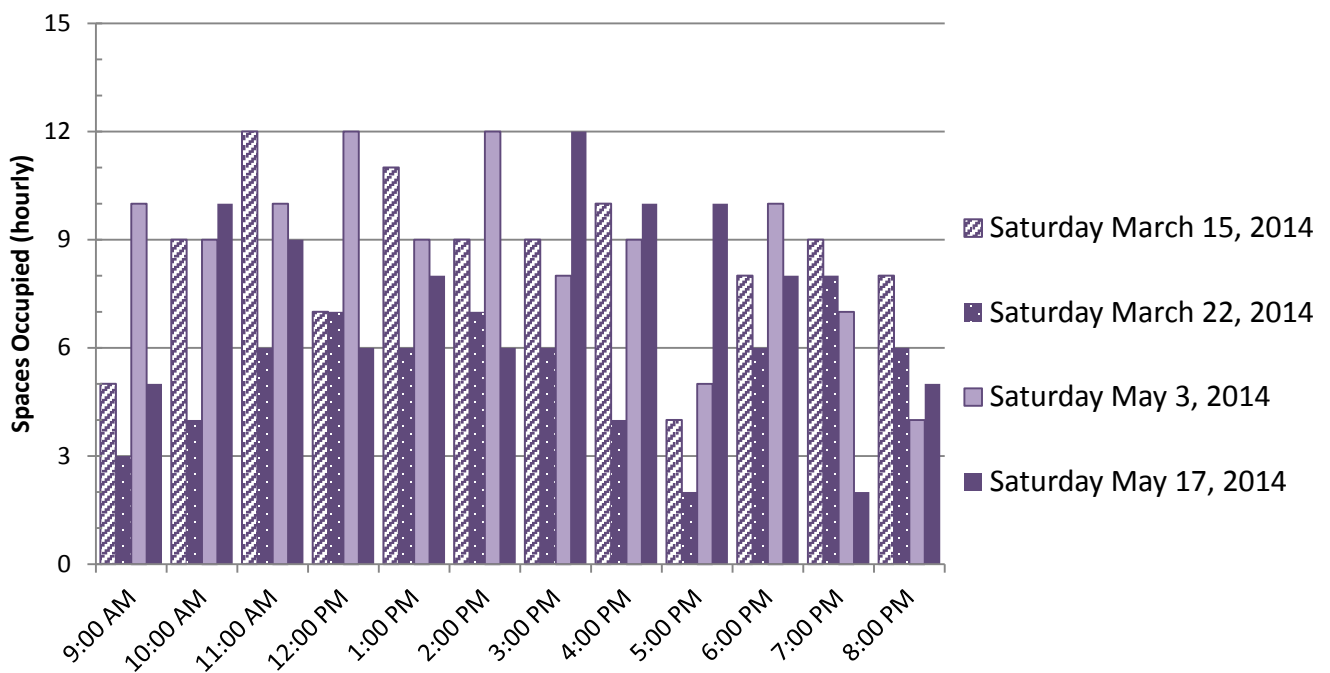


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**Chart 9: Hourly Weekday Occupancy (Zone 2 – Austin Street)**



**Chart 10: Hourly Saturday Occupancy (Zone 2 – Austin Street)**



In general parking in the Austin Street on-street meters tends to be steady throughout the course of the day, on both weekdays and Saturdays, while never reaching capacity. No correlation seems to be present between the occupancy of the Austin Street lot and the Austin Street on-street meters. In addition, parking within the Austin Street lot is free of charge on Saturdays, and therefore there is no incentive for patrons to park on Austin Street unless they are unaware of the free parking within the lot.

### **Zone 3: Walnut Street, south of Mass Pike**

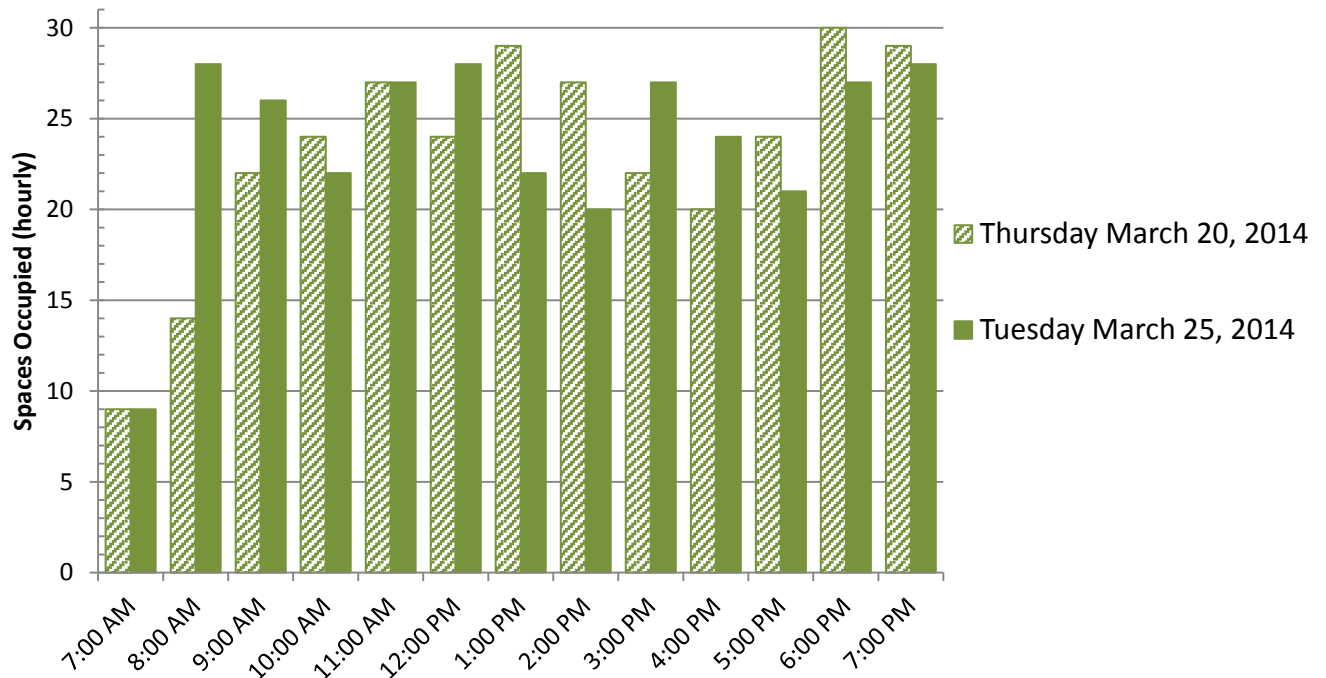
Along Walnut Street, south of the Mass Pike, hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on four Saturdays in March and May 2014. Walnut Street currently provides 31 on-street public parking spaces, 30 of which are metered and one designated handicap space. These spaces provide direct/front door access to the many retail businesses along Walnut Street in the Newtonville area.

Parking occupancy counts for the Walnut Street (south) meters (Zone 3) yielded average utilization to be approximately 76% and 79% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. Walnut Street, south of the Mass Pike was the parking zone in the study to experience the most consistent 100% occupancy. During the week, utilization of the Walnut Street (south) on-street meters peaked from 6:00 PM – 7:00 PM at 100% occupancy. On Saturday, peak overall utilization occurred multiple times between the hours of 10:00 AM – 2:00 PM at 100% occupancy, with 30 vehicles (this does not include the handicap space which was not occupied at the time). Chart 11 and Chart 12 below represent the hourly occupancy observations for the Walnut Street (south) meters (Zone 3) on the weekdays and Saturdays, respectively.

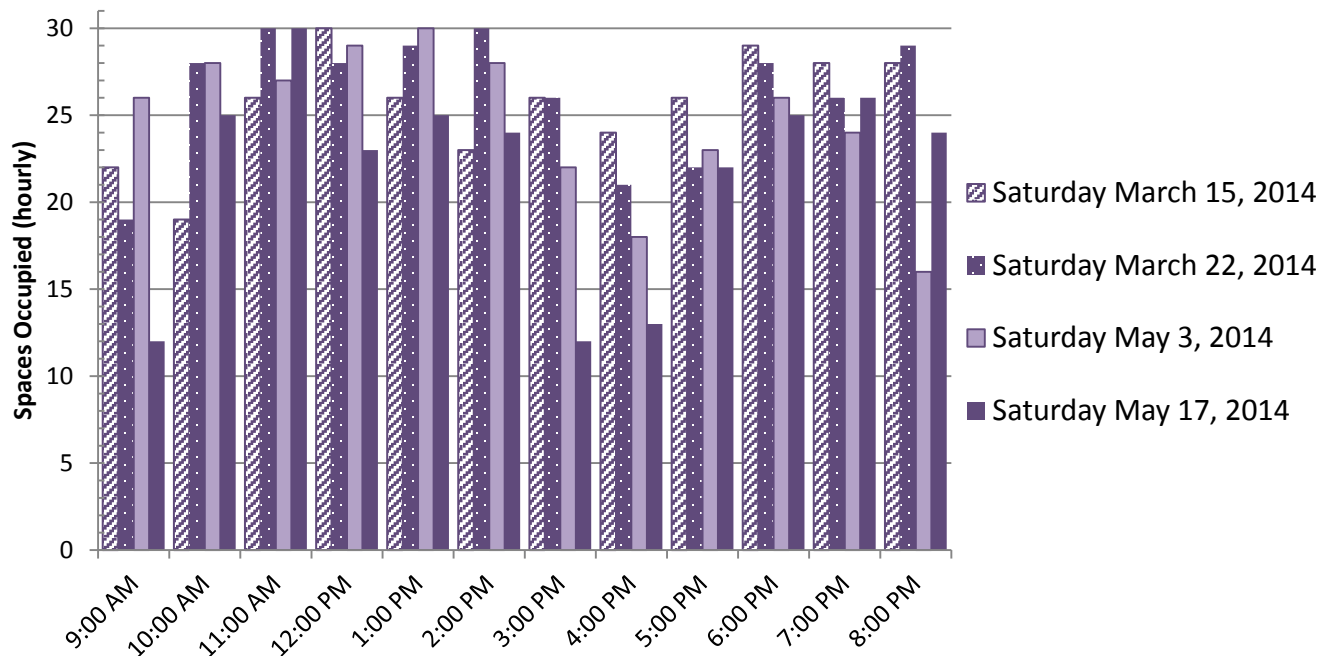


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**Chart 11: Hourly Weekday Occupancy (Zone 3 – Walnut Street south)**



**Chart 12: Hourly Saturday Occupancy (Zone 3 – Walnut Street south)**



In general parking on Walnut Street tends to be steady throughout the course of the day, on both weekdays and Saturdays, while generally being close to capacity. No strong correlation seems to be present between the occupancy of the Austin Street lot and the Walnut Street on-street meters.

### **Zone 4: Bowers Street/Newtonville Avenue/Madison Avenue**

East of Walnut Street, south of the Mass Pike along Bowers Street, Newtonville Avenue and Madison Avenue, hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on four Saturdays in March and May 2014. The physical definition of the extents to the east along these roadways observed as part of this study is shown within the aforementioned Figure 2. Bowers Street currently provides 15 on-street metered public parking spaces on both sides of the street, directly to the north of the intersection with Newtonville Avenue. Newtonville Avenue provides four on-street metered spaces directly east of Walnut Street and one handicap space, directly west of the intersection with Bowers Street. All parking on Newtonville Avenue is provided on the south side of the street. Madison Avenue provides two on-street metered spaces directly east of Walnut Street. All parking within Zone 4 is on-street and subject to a 2-hour time restriction.

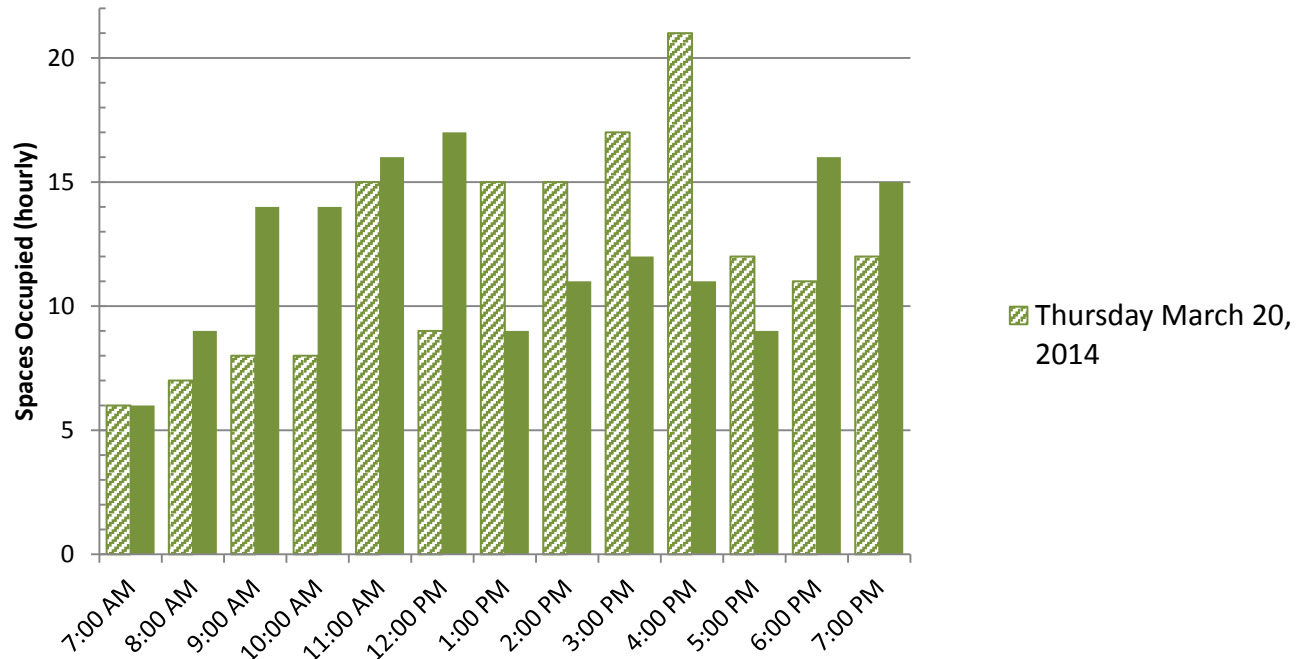
While the aforementioned parking inventory accounted for the unmetered spaces on-street for accounting purposes, these spaces are not included in these parking occupancy analyses, as these spaces are not considered a resource for retail/commercial development in Newtonville.

Parking occupancy counts for Bowers Street/Newtonville Avenue/Madison Avenue (Zone 4) yielded average utilization to be approximately 53% and 26% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. During the week, utilization of the meters in Zone 4 peaked from 4:00 PM – 5:00 PM at 95% occupancy with 21 vehicles parked in the 22 spaces. On Saturday, peak overall utilization occurred from 11:00 AM – 12:00 PM at 50% occupancy, with 11 vehicles. Chart 13 and Chart 14 below represent the hourly occupancy observations for Zone 4 on the weekdays and Saturdays, respectively. The x-axis represents each hour of the day (start time), while the top of the y-axis represents the total parking supply.

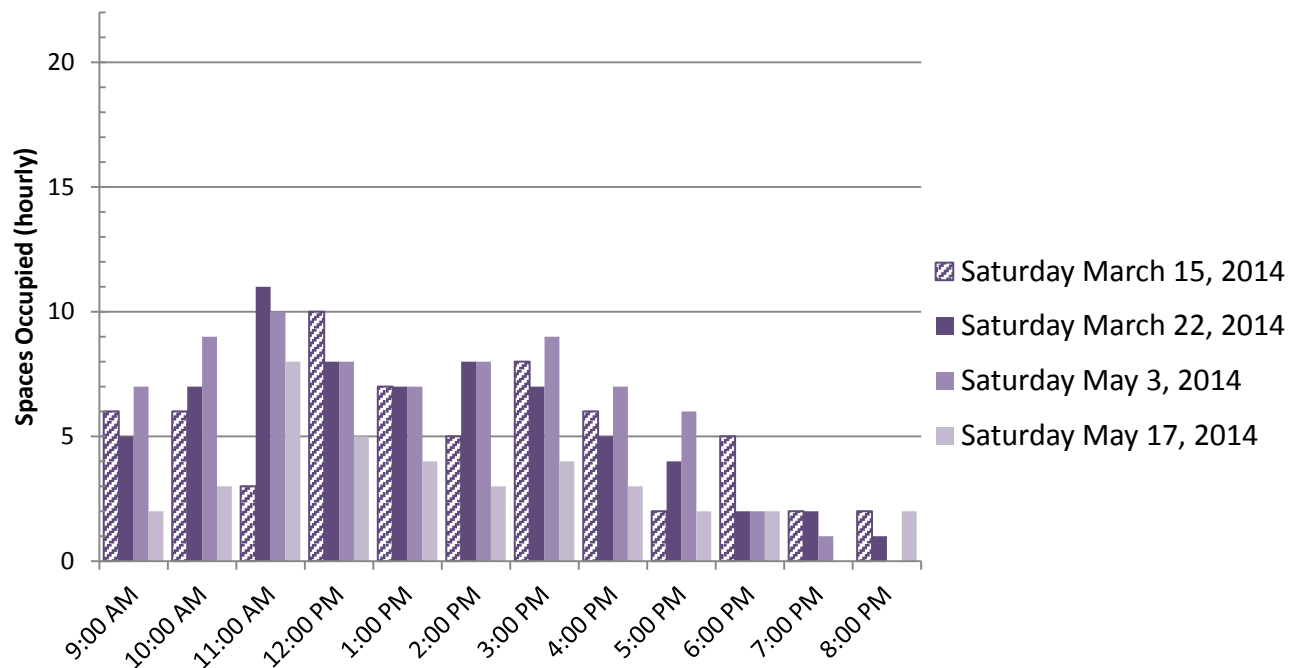


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**Chart 13: Hourly Weekday Occupancy (Zone 4 metered – Bowers, Newtonville, Madison)**



**Chart 14: Hourly Saturday Occupancy (Zone 4 metered – Bowers, Newtonville, Madison)**



As can be deduced from these data, parking demands within Zone 4 generally do not reach capacity, though the meters are more utilized on weekday versus Saturdays. Additionally, while Bowers Street provides meters, they are less accessible/ visible than the meters within the previous parking zones discussed. These spaces are also further away from the front door of the retail spaces along Walnut Street. Of the spaces within Zone 4, the six meters on Newtonville Avenue and Madison Avenue, directly abutting Walnut Street are the most utilized throughout the course of the days surveyed.

### **Zone 5: Highland Avenue**

West of Walnut Street, south of the Austin Street lot on Highland Avenue (Zone 5), hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on four Saturdays in March and May 2014. Highland Avenue provides five on-street metered public parking spaces on both sides of the street, directly to the west of Walnut Street.

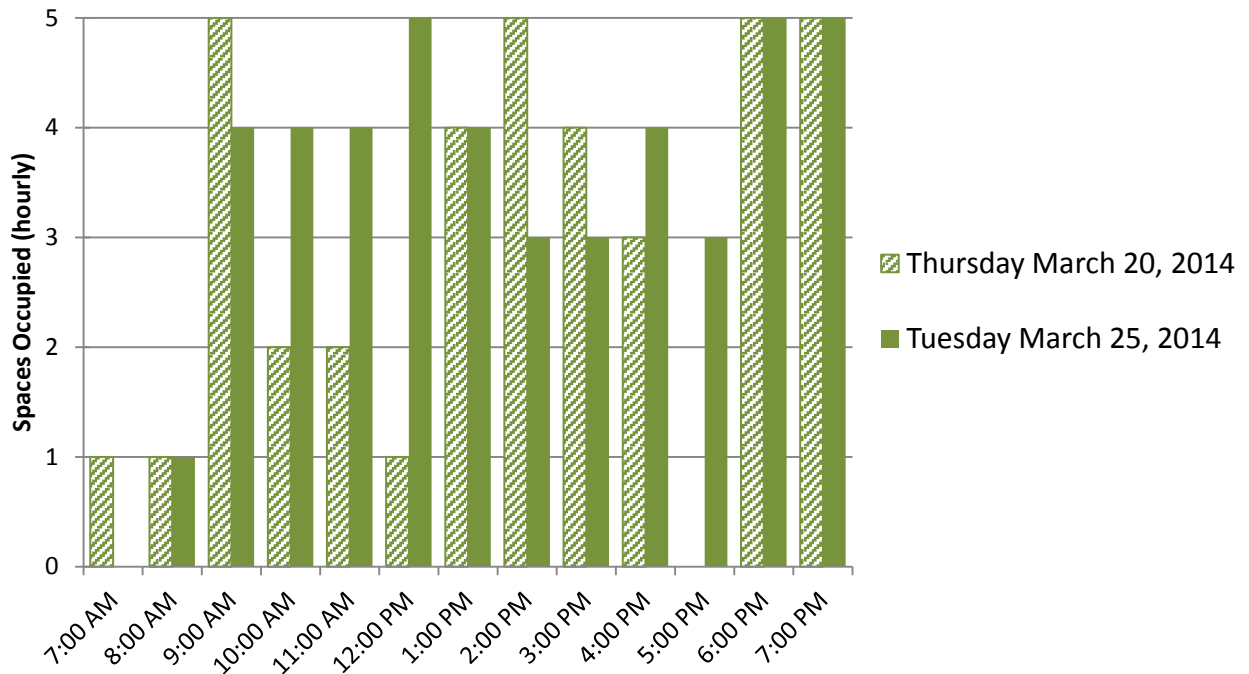
While the aforementioned parking inventory accounted for the unmetered spaces on-street for accounting purposes, these spaces are not included in these parking occupancy analyses, as these spaces are not considered a resource for retail/commercial development in Newtonville.

Parking occupancy counts for meters on Highland Avenue (Zone 5) yielded average utilization to be approximately 64% and 74% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. Throughout various hours of the day during both the week and on Saturdays, utilization of the Highland Avenue meters peaked from at 100% occupancy with 5 vehicles parked. Chart 15 and Chart 16 below represent the hourly occupancy observations for Highland Avenue (Zone 5) on the weekdays and Saturdays, respectively.

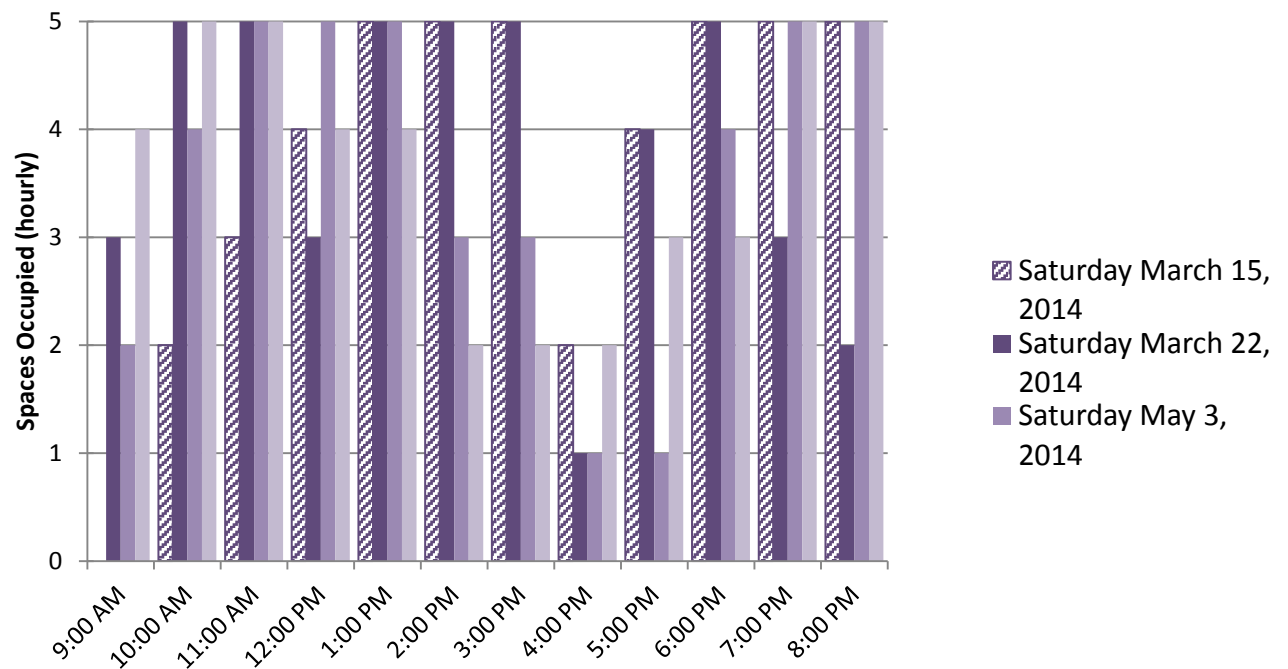


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**Chart 15: Hourly Weekday Occupancy (Zone 5 meters – Highland Avenue)**



**Chart 16: Hourly Saturday Occupancy (Zone 5 meters – Highland Avenue)**



In general, parking occupancy on Highland Avenue at metered spaces tends to be steady throughout the course of the day, on both weekdays and Saturdays, while generally being close to capacity. No strong correlation seems to be present between the occupancy of the Austin Street lot and the Walnut Street on-street meters. Much like Zone 4, of the spaces on Highland Avenue, the five meters directly abutting Walnut Street are the most utilized throughout the course of the days surveyed.

### **Zone 6: Washington Street/ Walnut Street (north of the Mass Pike)**

North of the Mass Pike along Washington Street and Walnut Street (north), hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on two weekdays and from 9:00 AM – 9:00 PM on two Saturdays in March 2014. The physical definition of the extents to the east along these roadways observed as part of this study is shown within the aforementioned Figure 2. Walnut Street (north) currently provides 10 on-street metered public parking spaces on both sides of the street, directly to the north of the intersection with Washington Street. One handicap space is provided on Walnut Street (north) on the east side of the street. Washington Street, west of Walnut Street provides 45 on-street metered spaces, east of Lowell Avenue. Of these 45 meters, 20 are designated 1-hour, seven 2-hour and 18 12-hour. In addition, six parallel on-street spaces on the south side of the street are designated for Post Office truck parking only; these spaces are not included in the study area inventory. Washington Street, east of Walnut Street provides 45 on-street metered spaces within the study area extents. Of these 45 meters, nine are designated 1-hour, 12 2-hour and 24 12-hour. In addition, one handicap space is provided on the north side of the street. It should be noted that 36 of the 45 spaces inventoried for this study on Washington Street, east of Walnut Street are “pull-ahead” spaces, rather than the standard parallel spaces that are typical to on-street parking. These spaces are located along the south side of Washington Street, west of Walnut Street and are restricted at 2-hour and 12-hour depending on the space.

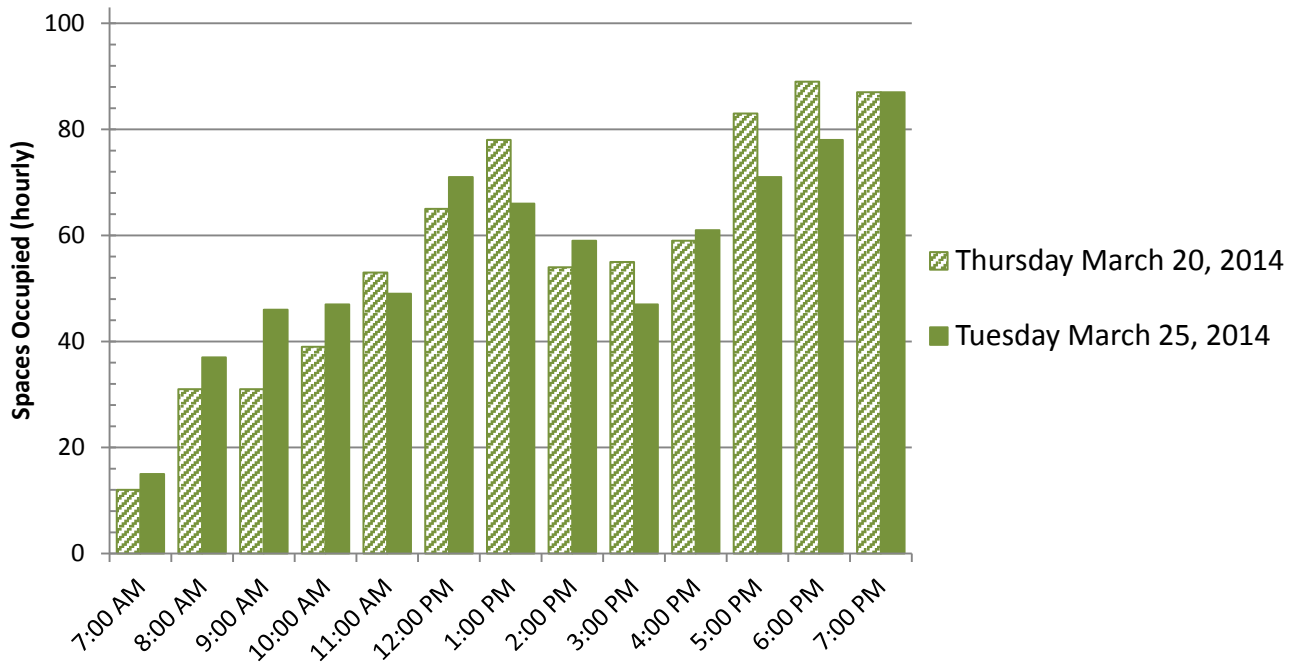
While the aforementioned parking inventory accounted for the unmetered spaces on-street for accounting purposes, these spaces are not included in these parking occupancy analyses, as these spaces are not considered a resource for retail/commercial development in Newtonville.

Parking occupancy counts for Washington Street/ Walnut Street, north of the Mass Pike (Zone 6) yielded average utilization to be approximately 55% and 57% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. During the week, utilization of Zone 6 peaked from 6:00 PM – 7:00 PM at 86% occupancy with 89 vehicles parked in the 103 spaces. On Saturday, peak overall utilization occurred from 1:00 PM – 2:00 PM at 87% occupancy, with 90 vehicles. Chart 17 and Chart 18 below represent the hourly occupancy observations for Zone 6 on the weekdays and Saturdays, respectively.

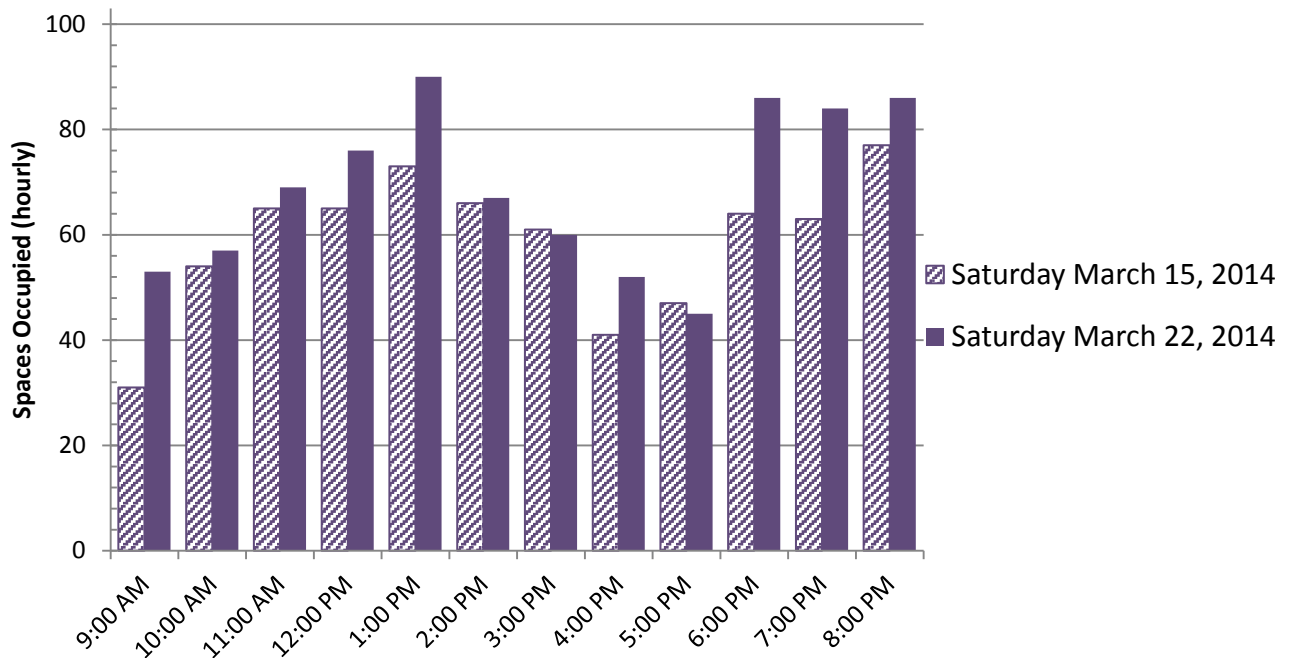


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**Chart 17: Hourly Weekday Occupancy (Zone 6 meters – Washington Street, Walnut Street north)**



**Chart 18: Hourly Saturday Occupancy (Zone 6 meters – Washington Street, Walnut Street north)**



In general parking to the north of the Mass Pike tends to be steady throughout the course of the day, on both weekdays and Saturdays, while hovering around 60% utilization. As the Mass Pike is a physical barrier, these spaces north of the Pike are considered less desirable to the area businesses south of the highway and tend to have their own dynamic in terms of utilization. Washington Street has an active ground-level of restaurants and retail spaces which is most likely the businesses that are utilizing these spaces today. It can also be noted from these data that the evening hours are more active on this side of the Mass Pike, than the south.

### **UTILIZATION OF SHAW'S PARKING**

In addition to the extensive parking occupancy observations that were made of the publicly available parking spaces within Newtonville, hourly parking occupancy counts were collected within the Shaw's Supermarket parking lots, located at 33 Austin Street, as well. Shaw's Supermarket currently provides two parking lots designated for its customers, staff and loading. The western lot (further from Walnut Street) provides 18 off-street parking spaces, four of which are utilized for tractor trailer loading. While it is not specifically signed, the western lot appears to be utilized by Shaw's staff and loading only, given its longer distance from the entrance of the store and the lower turnover of parking vehicles observed. Utilization of the four loading spaces is not considered as part of this study, as they do not provide parking for passenger vehicles. The eastern lot (closer to Walnut Street) provides 106 off-street spaces, five of which are designated handicap. In addition, within the eastern Shaw's lot, approximately 10 parallel spaces are utilized by patrons along the head-in spaces closest to the entrance of the store. Though these spaces are not marked by pavement markings, they are included in the occupancy study as they were utilized on a regular basis throughout the observation hours. This translates to a total of 130 off-street spaces within the Shaw's lots. Parking within the Shaw's lots is signed with a time restriction of 1.5 hours.

The hourly parking occupancy counts were conducted from 7:00 AM – 8:00 PM on Thursday, March 20, 2014 and 9:00 AM – 9:00 PM on Saturday, March 15, 2014 in order to capture a typical weekday and Saturday of parking activity. Shaw's hours of operations are from 7:00 AM – 10:00 PM every day of the week, therefore the store was open for all hours of the occupancy studies.

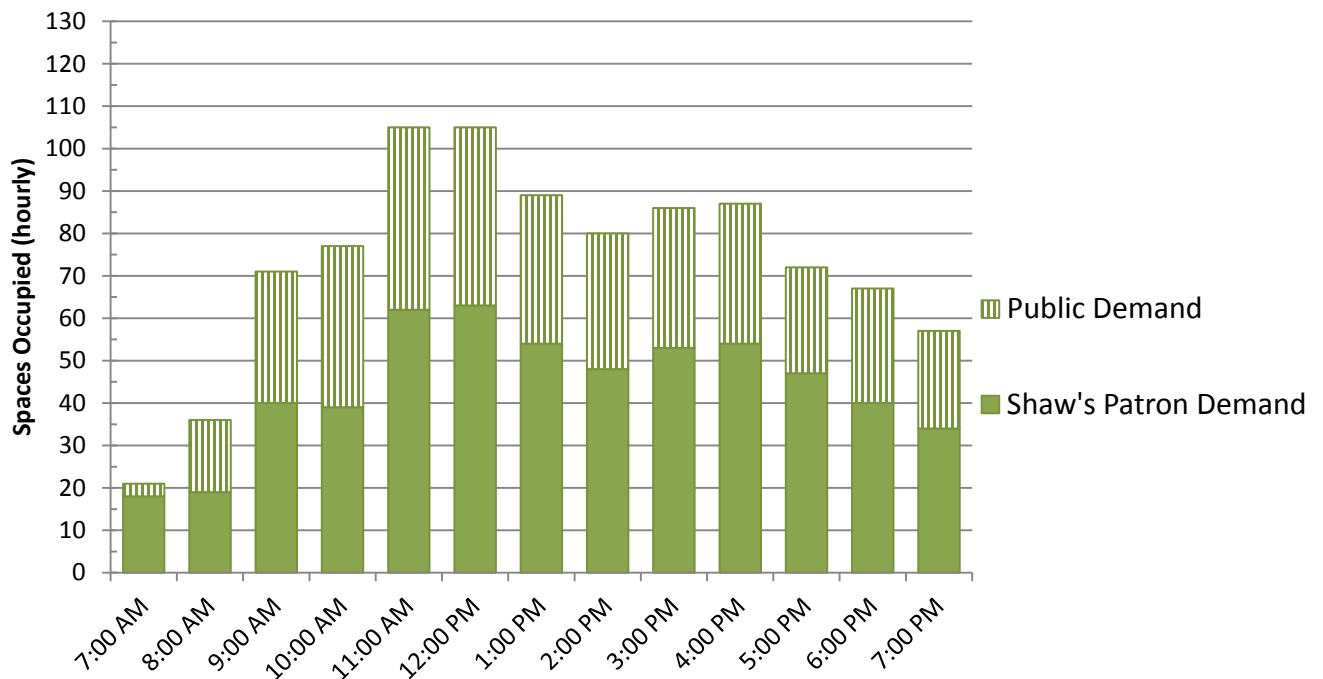
During the entirety of the parking occupancy counts, observations were made of the vehicles utilizing the Shaw's eastern lot. Specifically, the destination of parkers was noted as patronizing Shaw's or other Newtonville businesses. Based on in-field observations, it was determined that the 50 parking spaces located within the Shaw's eastern lot, east of the entrance driveway (closest to Walnut Street) are being utilized primarily by public parkers not associated with Shaw's.



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Parking occupancy counts for the Shaw's lots yield average utilization to be approximately 58% and 48% on a typical weekday from 7:00 AM – 8:00 PM and on a typical Saturday from 9:00 AM – 9:00 PM, respectively. During the week utilization of the Shaw's lots peaked from 12:00 PM – 1:00 PM at 83% occupancy. On Saturday, peak overall utilization also occurred from 12:00 PM – 1:00 PM at 75% occupancy. Chart 19 and Chart 20 below represent the hourly occupancy observations for the Shaw's lots on a weekday and Saturday, respectively.

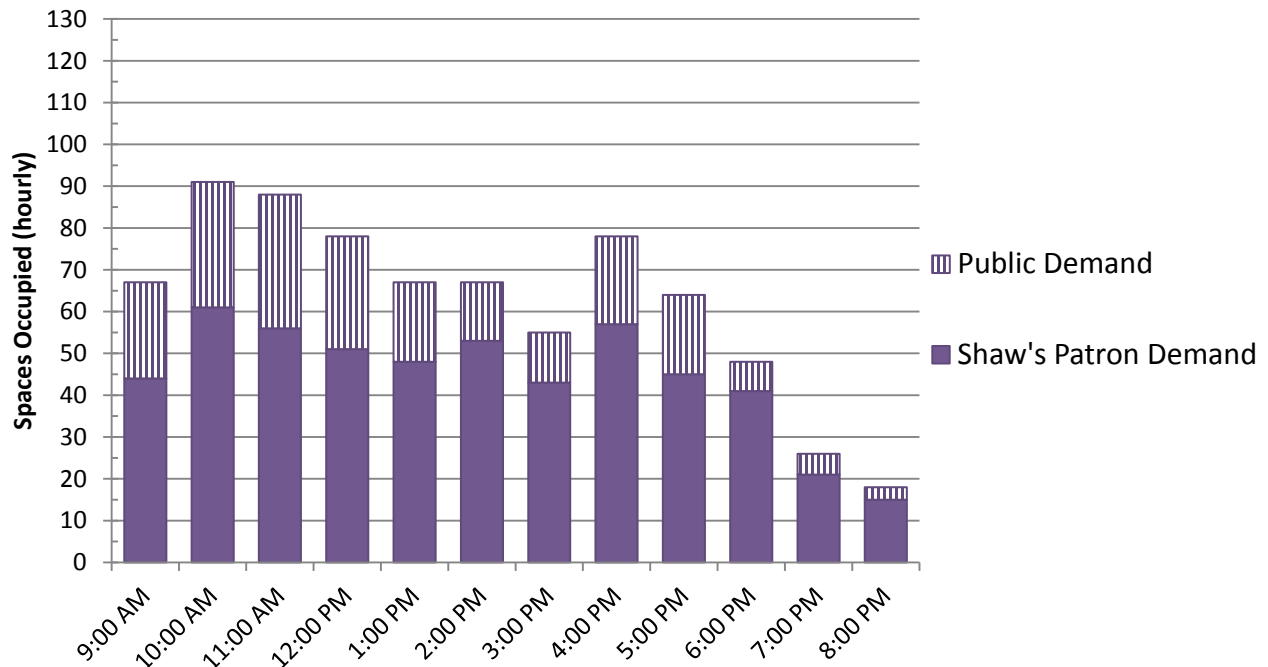


**Chart 19: Hourly Weekday Occupancy (Shaw's Supermarket)**



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**Chart 20: Hourly Saturday Occupancy (Shaw's Supermarket)**

It can be noted that the Shaw's lot experienced higher utilization during the week than Saturday, which is the inverse of the rest of the study area. On average, approximately 39% of the hourly demand within the Shaw's lot can potentially be attributed to public demand based on the observations of this study during the week. On Saturdays, this drops to approximately 26%. An important component of this pattern is the Austin Street lot is free on Saturdays, but not on weekdays. Shaw's lot is always free, therefore there is more incentive to park illegally at the Shaw's lot during the week, which may explain the inverse demand relationship. Public demand associated with the Shaw's lots is utilized within the following sections of the study as means of quantifying public demand within Newtonville.

## EXISTING NEWTONVILLE PARKING SUPPLY AND DEMAND

This section summarizes the demand for public commercial/retail parking and evaluates the balance of public parking supply and demand within the Village of Newtonville. The parking utilization counts show that the peak parking demand activity occurs in Newtonville from approximately 12:00 PM – 1:00 PM on Saturdays, and therefore this period is considered the peak period for supply. Figure 4 presents the overall peak occupancy, by zone, of meters spaces on an aerial map. The magnitude of the peak parking demand is primarily based on the parking



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occupancy counts. The demand for public parking consists of all metered on-street and off-street (Austin Street lot) parking, as well as some parking demand that is being accommodated by the privately-owned Shaw's lot. Table 4 summarizes the total public parking demand within the Newtonville both on weekdays and Saturdays, with Saturday representing the peak period. The tabulated demand represents the average of the peak occupancy observations, with consideration made to outliers within the data. The existing parking supply exceeds demand by approximately 67 spaces during the peak hour of 12:00 PM – 1:00 PM on Saturday. This surplus in parking is available throughout the study area and parking zones, though not uniformly. These available metered spaces are considered a resource for retail/commercial uses in the Newtonville study area.

Table 4: Existing Area-wide Newtonville Public Parking Supply and Demand - Metered\*

Public Parking Supply	Time Period	Peak Parking Demand			Surplus
		In Public Spaces	In Shaw's lot**	Total	
303	Weekday 1-2 PM	181	35	216	87
	Saturday 12-1 PM	209	27	236	67

\* Represents metered public parking spaces including handicap spaces as they are striped and signed spaces

\*\* Shaw's lot public demand is an estimation based on in-field observations



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Table 5 summarizes the localized metered public parking supply and demand by zone during the peak hour on Saturday. This summary further demonstrates where the existing surplus of parking available within Newtonville lies.

Table 5: Newtonville Metered Parking Supply and Demand by Zone – Critical Saturday Peak

Parking Zone – Metered Only	Total Metered Parking*		
	Supply	Demand	Surplus
Zone 1: Austin Street lot	127	93	34
Zone 2: Austin Street	15	8	7
Zone 3: Walnut Street (south of Mass Pike)	31	27	4
Zone 4: Bowers Street, Newtonville Street, Madison Avenue	22	9	13
Zone 5: Highland Avenue	5	4	1
Zone 6: Washington Street, Walnut Street (north of Mass Pike)	103	68	35
<b>Total within Public Metered Parking</b>	<b>303</b>	<b>209</b>	<b>94</b>
Shaw's lot – Displaced Public Demand**	n/a	27	(-27)
<b>Total Parking</b>	<b>303</b>	<b>236</b>	<b>67</b>

Average of Saturday observations for peak hour 12:00 PM – 1:00 PM

\* Total metered parking includes handicap spaces as they are striped and signed spaces

\*\* Shaw's lot public demand is an estimation based on in-field observations

Considering the metered parking surplus by zone, it becomes clear that the surplus is currently available in Zones 1 and 6, with approximately 1/3<sup>rd</sup> of the current surplus being available in the Austin Street lot and another 1/3<sup>rd</sup> available north of the Mass Pike on Washington Street. The remaining 1/3 is divided among Zones 2, 3, 4 and 5. With 209 of the total 303 currently parked within public metered spaces, the occupancy is approximately 69%. With the refinement to include the Shaw's public demand, 236 of the total 303 spaces will be occupied, translating to 78% occupancy. Whether the Shaw's displaced public demand is considered or not, the existing public parking occupancy falls within the functional supply for parking.

## PARKING SURVEYS

Another component of this study included in-person parking surveys within the Austin Street lot in order to provide further clarity and understanding of the functionality of this lot. Specifically, five survey questions were posed to willing participants whom were witnessed parking in the lot



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during the survey periods of 7:00 AM – 8:00 PM on Thursday, March 20, 2014 and 9:00 AM – 9:00 PM on Saturday, March 22, 2014. These questions included:

1. Where are you coming from? (work, home, etc.)
2. Where are you going after?
3. What town did you come from?
4. Which business are you visiting in Newtonville?
5. Do you find parking in Newtonville to be easy or difficult?

The intended purpose of these questions is to gain a holistic comprehension of who the users of the Austin Street lot are, where they are coming from, and which businesses they are patronizing. Table 6 below summarizes the findings of these surveys.

**Table 6: Newtonville Parking Survey Results**

Survey Question	Response Percentages							
	Weekday				Saturday			
Question 1: Where are you coming from?	Home 57%	Work 40%	Other 3%		Home 83%	Work 4%	Other 13%	
Question 2: Where are you going after?	Home 70%	Work 25%	Other 5%		Home 76%	Work 13%	Other 11%	
Question 3: What town did you come from?	Newton 82%		Other 18%		Newton 88%		Other 12%	
Question 4: Which businesses are you visiting?	Coffee 40%	Yoga 14%	Other Retail 28%	Other Services* 18%	Coffee 40%	Yoga 20%	Other Retail 32%	Other Services* 8%
Question 5: Do you find parking in Newtonville easy or difficult?	Easy 88%	Easy, time dependent 5%	OK 4%	Difficult 3%	Easy 63%	Easy, time dependent 8%	OK 20%	Difficult 9%

\* Other services include the Senior Center, Voice and Dance lessons, Commuter Rail Station, Library and Church.

The survey results summarized within Table 6 present the responses of 339 participants (162 on the weekday/ 177 on the Saturday). The relationship between Questions 1 & 2 infer that the majority of trips to the Austin Street lot during the week are part of a trip-sequence which originates from home/work, stops in Newtonville, then continues to the final destination of home/work. Trips on Saturdays generally are primary trips which originate at home, then to Newtonville and finally back home. This trend is common for many retail-based land uses.



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A significant percentage of the users of the Austin Street lot are Newton residents, with over 80% of respondents residing in Newton. A variety of the businesses within Newtonville were the destination of the respondents, with the majority patronizing the various coffee shops, visiting the yoga studio and other retail/restaurant spaces along Walnut Street.

With regards to level of difficulty parking within the Newtonville area, the majority of respondents find it easy with 88% and 63% on the weekday and Saturday, respectively. On Saturday the “easy” responses decreased by a rather considerable 25% from the weekday responses. This pattern directly correlates to the parking occupancy data discussed in the previous section of this study. Saturdays experienced far higher demand than the weekdays, therefore supporting the perception of parking being more difficult in Newtonville. Survey response data is provided in the Appendix for reference.

## PARKING TURNOVER

The final component associated with the existing analyses of the Newtonville parking relates to turnover. Turnover is defined as a measure of the average number of cars using a parking space during a defined time period. Therefore, the higher the turnover the greater number of different vehicles utilizing the same space. The parking turnover study was conducted by recording the last three digits of the license plate of each car parked in each space within the study area every hour throughout the course of the day. These data then provided information about the arrival time, departure time, and length of stay for each vehicle. Table 7 provides a summary of some key results associated with the study.

Table 7: Newtonville Parking Daily Turnover Summary\*

Parking Zone	Number of Spaces	Average Weekday		Average Saturday	
		Number of Parkers	Turnover	Number of Parkers	Turnover
Zone 1: Austin Street lot	127	361	2.8	467	3.7
Zone 2: Austin Street	15	93	6.2	81	5.4
Zone 3: Walnut Street (south of Mass Pike)	31	270	8.7	279	9.0
Zone 4: Bowers Street, Newtonville Street, Madison Avenue	73	246	3.4	145	2.0
Zone 5: Highland Avenue	50	80	1.6	79	1.6
Zone 6: Washington Street, Walnut Street (north of Mass Pike)	120	505	4.2	589	4.9
Shaw's lot	130	508	3.9	534	4.1

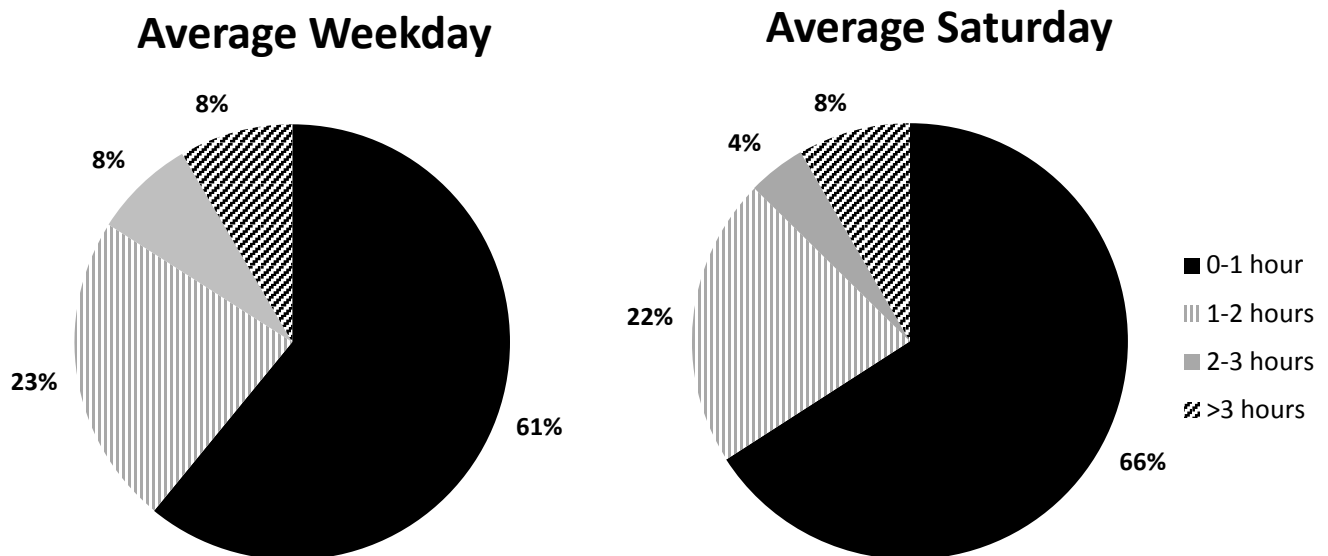
\* Represents all parking spaces - metered and unmetered



The most notable finding from this study is the high turnover experienced along the Walnut Street meters within Zone 3 (south of Mass Pike), while the Austin Street lot experiences a relatively low turnover. As could be expected from the parking occupancy data discussed previously, the predominately metered parking zones tend to experience a higher turnover throughout the course of the day in comparison to the predominately unmetered zones.

From these data, no clear relationship can be deduced in terms of lower or higher turnover being experienced on an average weekday versus an average Saturday, however each of the six parking zones do experience similar turnover on weekdays and Saturdays.

In order to further understand hourly turnover patterns within the Austin Street lot, a review of specific vehicle dwell time was examined. The percent breakdown of the resulting average weekday and average Saturday dwell times observed within the Austin Street lot is presented within Chart 21 below.



**Chart 21: Parking Turnover Summary (Zone 1 - Austin Street Lot)**

Results of the parking turnover patterns within the Austin Street lot indicate that almost two-thirds of all users park in the lot for less than hour. Moreover, approximately 85% of users park for less than two hours. This trend is notable considering all parking within the lot provides for at least three-hours of parking time restriction. Observed patterns in terms of turnover within the lot are quite similar on both weekdays and Saturdays, especially considering the lack of time and cost restrictions on weekends.



### ***FUTURE CONDITIONS***

When estimating parking demands associated with the redevelopment of the Austin Street lot, the Institute of Transportation Engineers (ITE) Parking Generation Handbook<sup>1</sup> is recommended to be utilized. However, this reference manual provides parking demand rates associated with specific land uses and provides a relatively conservative metric for estimating parking demands as they generally represent suburban locations, without access to public transportation. In order to account for the local presence of public transportation options in the area, the ITE Trip Generation Handbook<sup>2</sup> recommends a 15% vehicle trip reduction associated with residential-oriented mixed-use developments within ¼-mile from a transit center or light rail station.

It should be understood that an evaluation of parking demands associated with a mixed-use development varies greatly with design features and land uses. For example, the uses in the retail space could have vastly different characteristics; some geared towards a shared use with residents of the building (therefore not driving), whereas a destination store with a high turnover potential will demand additional parking spaces and generate more new vehicular trips to Newtonville. It has been assumed for the purposes of this study, that new demands will be addressed once the project is designed and specific uses identified, with a net neutral parking impact resulting. Thus, the complexities of assessing parking merits refinement in order to properly assess the possible parking impacts of new uses, understanding that the design of the facility and the parking provided will inform each other within the parameters of the zoning regulations.

Regarding public parking, it is recommended to plan for the demand of a typical day, with an additional 15% allowance to avoid excessive circulation of vehicles seeking parking. This

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<sup>1</sup> *Parking Generation Handbook, 4<sup>th</sup> Edition*; Institute of Transportation Engineers (ITE); 2010.

<sup>2</sup> *Trip Generation Handbook, 2<sup>nd</sup> Edition*; Institute of Transportation Engineers (ITE); June 2004.



allowance represents the industry standard goal of demand not exceeding 85% of supply. In general 85% of overall supply is considered the ‘functional supply’ of a parking system.

### **HYPOTHETICAL DEVELOPMENT PARKING DEMAND (PER ITE STANDARDS)**

Given the flexibility of potential development opportunities of the Austin Street lot site, an evaluation of parking demands associated with a hypothetical mixed-use development on the site is presented in the following section. Parking demand impacts associated with a hypothetical project of 100 residential units and 10,000 square feet (sf) of retail/restaurant space is presented below utilizing ITE parking rates. This evaluation does not represent a true proposed redevelopment project or actual conditions at Austin Street. For purposes of these analyses, current City of Newton zoning requirements for parking are not considered.

ITE land use codes (LUC) associated with Low/Mid-Rise Apartment (LUC 221) and Shopping Center (LUC 820) are utilized, representing the most appropriate available data for this parking demand analysis. According to ITE, the residential component (LUC 221) yields a peak (85<sup>th</sup> percentile) parking demand of 1.61 spaces/ unit on weekdays and 1.14 spaces/ unit on Saturdays. With the 15% reduction for transit, these rates translate to 1.37 spaces/ unit on weekdays and 0.97 spaces/ unit on Saturdays. The retail component (LUC 820) yields a peak parking demand of 3.16 spaces/1,000 sf on weekdays and 3.40 spaces/1,000 sf on Saturdays. Table 8 and Table 9 provide a summary of the percentage of the peak parking demand utilized by hour of the day, highlighting peak demand for weekdays and Saturdays, respectively.



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Table 8: Hypothetical (ITE) Development Parking Demand by hour - Weekday

Time of Day	Residential (100 units)		Retail (10 ksf)		Shared Parking Development Demand
	Percent of Peak	Demand	Percent of Peak	Demand	
12:00 AM – 4:00 AM	98%	134	0%	0	134
5:00 AM	<b>100%</b>	<b>137</b>	0%	0	<b>137</b>
6:00 AM	84%	115	0%	0	115
7:00 AM	62%	85	5%	2	86
8:00 AM	41%	56	18%	6	62
9:00 AM	34%	47	38%	12	59
10:00 AM	32%	44	68%	21	65
11:00 AM	31%	42	91%	29	71
12:00 PM	30%	41	<b>100%</b>	<b>32</b>	73
1:00 PM	31%	42	97%	31	73
2:00 PM	33%	45	95%	30	75
3:00 PM	37%	51	88%	28	78
4:00 PM	45%	62	78%	25	86
5:00 PM	61%	83	62%	20	103
6:00 PM	69%	94	64%	20	115
7:00 PM	72%	99	77%	24	123
8:00 PM	80%	109	70%	22	132
9:00 PM	89%	122	42%	13	135
10:00 PM	92%	126	0%	0	126
11:00 PM	94%	129	0%	0	129

Source: ITE Parking Generation Handbook, 4<sup>th</sup> Edition – LUC 221/820. Hourly distribution for residential based on LUC 224 (Rental Townhouse)

As can be seen within Table 8, during the week the peak parking demand for the residential component of a hypothetical ITE development occurs at 5:00 AM at 137 spaces. The peak demand for the retail occurs at 12:00 PM at 32 spaces. The summation of these two components (137 spaces + 32 spaces = 169 spaces) represents the total parking demand for a hypothetical ITE development if the parking spaces are not shared between residential and retail users. The shared parking development demand column represents the summation of the hourly parking demand for a hypothetical ITE development, assuming that the parking is not exclusive to particular land uses, but rather is shared between the residential and retail users, resulting in a total parking demand of 137 spaces on a weekday. Essentially sharing the parking between various users allows for a reduction in 32 spaces. These equivalent analyses are provided in Table 9 for Saturday.



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Table 9: Hypothetical (ITE) Development Parking Demand by hour - Saturday

Time of Day	Residential (100 units)		Retail (10 ksf)		Shared Parking Development Demand
	Percent of Peak	Demand	Percent of Peak	Demand	
12:00 AM – 4:00 AM	95%	92	0	0	92
5:00 AM	<b>100%</b>	<b>97</b>	0	0	97
6:00 AM	98%	95	0	0	95
7:00 AM	94%	91	13%	4	96
8:00 AM	89%	86	27%	9	95
9:00 AM	59%	57	60%	20	78
10:00 AM	71%	69	75%	26	94
11:00 AM	67%	65	90%	31	96
12:00 PM	66%	64	<b>100%</b>	<b>34</b>	98
1:00 PM	64%	62	<b>100%</b>	<b>34</b>	96
2:00 PM	64%	62	98%	33	95
3:00 PM	69%	67	91%	31	98
4:00 PM	73%	71	76%	26	97
5:00 PM	78%	76	67%	23	98
6:00 PM	80%	78	72%	24	<b>102</b>
7:00 PM	83%	80	51%	17	98
8:00 PM	84%	81	52%	18	99
9:00 PM	87%	84	44%	15	99
10:00 PM	89%	86	29%	10	96
11:00 PM	95%	92	0	0	92

Source: ITE Parking Generation Handbook, 4<sup>th</sup> Edition – LUC 221/820. Hourly distribution for residential based on LUC 224 (Rental Townhouse)

Table 9 demonstrates that on a typical Saturday the peak parking demand for the residential component of a hypothetical ITE development occurs at 5:00 AM at 97 spaces. The peak demand for the retail occurs at 12:00 PM and 1:00 PM at 34 spaces. The summation of these two components (97 spaces + 34 spaces = 131 spaces) represents the total parking demand for a hypothetical ITE development if the parking spaces are not shared between residential and retail users. The shared parking development demand results in a total parking demand of 102 spaces for a Saturday, resulting in a reduction of 29 spaces.

In order to determine the actual peak demand for a hypothetical ITE development, the peak demand for each land use component needs to be considered, regardless of day of week. Therefore, the weekday demand of 137 spaces dictates the required number of spaces for residential, while the Saturday demand of 34 spaces dictates the required number of spaces for retail. These values must be summed to establish the separated or unshared parking demand. For



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the shared parking value, the combined parking demand peaks at 137 spaces. Table 10 summarizes the results of the development parking demand analyses.

**Table 10: Hypothetical (ITE) Development Parking Demand Summary**

Day of Week	Peak Parking Demand		Unshared Development Demand		Shared Development Demand
	Residential	Retail	Total Peak Demand	Functional Supply (+15% for Retail)	
Weekday	137	32	171	176	137
Saturday	97	34			

As shown in Table 10, the overall unshared parking demand for a hypothetical ITE development is 171 spaces, and the total shared parking demand is 137 spaces. When the concept of functional supply is applied to the retail values, the outcome is 176 spaces are required to meet demands if the parking is unshared. If the parking is shared, the parking space demand remains at 137 spaces as more than the required 34 retail spaces are projected to be available for sharing at 12:00 PM on Saturdays. Calculations associated with these analyses are provided within the Appendix.

A variation of these analyses is to consider the residential component a fixed demand, as parking for residents of a hypothetical ITE development may be controlled through a parking permit program. For purposes of discussion, it may be assumed that 1.0 space/ unit is provided for residents of the development, or 100 resident parking spaces. Table 11 summarizes the parking demand analyses associated with this assumption.

**Table 11: Hypothetical (ITE) Development Parking Demand Summary – Residential 1.0 space/unit**

Day of Week	Peak Parking Demand		Unshared Development Demand		Shared Development Demand
	Residential	Retail	Total Peak Demand	Functional Supply (+15% for Retail)	
Weekday	100	32	134	139	108
Saturday		34			

As shown in Table 11, the overall unshared parking demand is reduced to 139 spaces (by 37 residential spaces), and the total shared parking demand is reduced to 108 spaces assuming 1.0 space/ unit for residents. When the concept of functional supply is applied to the retail values, the outcome is 136 spaces are required to meet demands if the parking is unshared. If the parking is shared, the parking space demand is 108 spaces. The reason this does not remain at 100 spaces is due to 34 spaces not being readily available with the reduction of the total shared spaces from 137 to 100.



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These projections represent a conservative approach to a hypothetical development's parking demand analyses, as they represent ITE parking rates, which generally depict suburban areas without access to public transportation. Given the vision of creating a walkable, transit-oriented mixed-use development for Newtonville, an alternative and appropriate approach is to consider parking rates utilized by the Boston Transportation Department (BTD) as set forth in the Access Boston 2000-2010 Citywide Transportation Plan<sup>3</sup>.

Understanding that Newtonville is serviced by local bus routes and the MBTA's Commuter Rail and not serviced by the subway (the "T") is an important consideration. BTD's Access Boston report defines parking rates for both non-residential and residential developments by neighborhood in Boston. The neighborhoods of Hyde Park, Roslindale, and West Roxbury are all neighborhoods which are not considered part of Boston Proper or the urban-core of the City and they are all serviced by Commuter Rail stations and local busses, but not the subway. Recommended parking rates for non-residential uses in these neighborhoods are 1.0-1.5 spaces/1,000 square feet and 1.0-1.5 spaces/ unit for residential uses. Utilizing these rates yields a parking range of 10-15 spaces for 10,000 square feet of retail development and 100-150 spaces for 100 units of residential. Table 12 presents the results of these analyses.

Table 12: Hypothetical (BTD) Development Parking Demand Summary

1.0 space ratio		1.5 space ratio		Aggregate Total
Residential	Retail	Residential	Retail	
100	10	150	15	115

Given the ability for controlling the residential component of a hypothetical BTD development, the low-end of the range (1.0 space/ unit) is considered appropriate for Newtonville, while to remain conservative on the retail demand, the high-end of the range (1.5 spaces/1,000 sf) is considered more appropriate. This aggregate total yields a total of 115 spaces for the development, according to BTD guidelines. Documentation for these parking guidelines is provided in the Appendix.

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<sup>3</sup> Access Boston 2000-2010 Boston's Citywide Transportation Plan; City of Boston; 2002.



### **CONSTRUCTION PERIOD IMPACTS**

Careful attention should be paid to parking management during construction and the means of undertaken will be based on project design, staging and construction methods. To the extent possible, the ability to maintain any number of public parking spaces within or near the lot will lessen parking and traffic circulation impacts associated with the construction. Purposefully-placed signage directing drivers to alternative parking options will allow for efficient parking management for the Newtonville area. Additionally, informational signage regarding any detours will preclude unnecessary traffic circulation.

Off-site parking for construction workers is recommended with consideration regarding the walkability to the site or the provision of an on-demand shuttle system should be implemented for workers. This management of worker parking will have the added benefit of minimizing construction vehicle impacts within the retail business area of Newtonville.

In order to minimize the length of the construction period impacts on-site, execution of any construction off-site is recommended. Consideration for any construction techniques which allow for fabrication or preparation off-site should be made.

### **TRAFFIC CIRCULATION ALTERNATIVES**

During construction planning for traffic circulation patterns is critical. The intersection of Walnut Street at Austin Street provides a unique set of challenges given its geometry and may be a vital point of access for any development of the site. Currently, intersection and stopping sight distance restrictions are present for vehicles travelling on Austin Street, turning onto Walnut Street and for vehicles travelling southbound on Walnut Street approaching the intersection. In particular, vehicles looking left from Austin Street face a considerable grade change and vertical crest curve on Walnut Street on the bridge over I-90, restricting sight distance. Likewise, vehicles travelling southbound on Walnut Street travel over the crest curve, with limited sight before travelling downgrade to the intersection. Additional challenges include the offset with Newtonville Avenue to the east which provides the opportunity for overlapping left turns with Austin Street. The center of the intersection also provides a well-utilized pedestrian crosswalk with refuge island, adding to the unique dynamics of the intersection.

While the intersection seems to function safely and at a reasonable level of service with minimal queuing on Austin Street under existing conditions, the introduction of a development with access/egress onto Austin Street could warrant changes, such as a traffic signal. The nature of such changes depends on the project design as well as the location and number of access points



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to the site and implementation of a signal at this location may not be desired for the Village. Consideration should also be made with regards to the implementation of one-way travel patterns, particularly with Austin Street. If Austin Street were to become one-way in the westbound direction, this would prohibit vehicles from existing Austin Street at Walnut Street, solving the aforementioned issues at that key intersection. On-street parking could potentially be extended down Austin Street as well as one-way travel requires less right-of-way.

Routing of traffic from the Austin Street lot to both Austin Street and Highland Avenue could alleviate some pressure on each respective street. To the extent possible, it is preferred to maintain two access/egress driveways to the development, to allow for optimal circulation patterns within the development site. Maintaining access to the site from both Austin Street and Philip Bram Way allows for this circulation, as well as conserving existing travel patterns with the current access. This layout also maximizes the disbursement of traffic coming to/from the development site, allowing for the minimum impact to be realized at any given intersection/corridor within the area. Attention should be given to the traffic generated so that the traffic can be directed to each street in a manner that will cause the least impacts to each.

Lastly, given the current scale and land uses of the hypothetical development discussed within this study, both the commercial and residential components project similar vehicular trip generation values. Separation of these vehicle trips associated with these land uses to various access/egress points for the study is not considered to be necessary or preferred, but simply neutral in terms of impact.



## ***CONCLUSIONS***

The findings of this study determined that the existing parking supply of metered spaces<sup>4</sup> exceeds demand by approximately 67 spaces during the peak hour of 12:00 PM – 1:00 PM on Saturday. This surplus in parking is available throughout the study area and parking zones, though not uniformly. These available metered spaces are considered a resource for retail/commercial uses in the Newtonville study area. With the refinement to include the Shaw's public demand, 236 of the total 303 spaces will be occupied, translating to 78% occupancy. Whether the Shaw's displaced public demand is considered or not, the existing public parking occupancy falls within the functional supply for parking.

An evaluation of parking demands associated with a hypothetical ITE mixed-use development of 100 residential units and 10,000 square feet of retail/restaurant space yields a parking demand ranging from 108 to 176 spaces depending on parking management strategies of the specific development. As the development proposal progresses a more refined evaluation of parking and traffic circulation impacts will be required in order to fully understand demands.

Based upon the analyses and findings of this study, GPI offers the following recommendations for parking management within the Village of Newtonville for consideration by the City of Newton.

### **Intelligent Parking System**

With the construction of a new parking garage system as part of the Austin Street development, it is recommended that the City consider the requirement of the installation of an intelligent parking system to service the new garage. Specifically, the garage should track parking space

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<sup>4</sup> Considers only metered spaces in Zones 4 through 6.



occupancy within the garage by maintaining a continuous count of vehicles which have entered and exited the facility. By maintaining this count, the intelligent parking system then communicates to strategically-placed variable message signage which updates users entering the Newtonville area and looking for parking. The recommended locations of these signs would ideally intercept users entering the Newtonville area to inform them that the garage has vacancy or is at capacity. Potential locations may be a sign along Austin Street facing west, a sign at the intersection of Walnut Street at Austin Street, and a sign on Walnut Street at Highland Avenue. The goal being these users now can make informed decisions about where to look for parking, without turning onto Austin Street or Philip Bram Way unnecessarily circulating throughout the Newtonville roadway system.

### **Parking Regulation Uniformity**

With the redevelopment of the Austin Street lot, the on-street metered spaces and potential garage within the future development should be consistently priced throughout. The hours of paid parking are currently 8:00 AM – 6:00 PM for all meters during the week and Saturdays, and it should be the same hours of enforcement in the garage. Currently the Austin Street lot is free on Saturdays. This different treatment of particular metered parking spaces in the area is not ideal and is recommended to be updated for the future development parking system. Consistent and clear signage of parking regulations is recommended.